



2016 Slovak
Presidency of the
Council of the
European Union



Developing a European Research and Innovation Ecosystem for Innovative SME's



Acknowledgements

This booklet is a collection of thought-provoking and inspiring examples and ideas from different countries across Europe. All of the content used, was contributed by Member States and collected to support the discussion on the topic of Developing a European Research and Innovation Ecosystem for Innovative SME's during the Slovak Presidency of the Council of the EU.

We thank all delegations for their valuable contributions.



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Foreword



Dear readers,

The Slovak Presidency of the Council of the European Union represents a unique opportunity to promote European science and research, and Slovakia's contribution in these areas, by showcasing areas that we see to be of special importance and benefit.

It is evident that innovation is the key to ensure the competitiveness of EU Member States in the globalised marketplace. Innovation is the practical result of work of scientists and researchers finding new solutions to old problems and to the new ones, too.

Science is something that Slovakia needs working harder on, both in the public and private sectors. I hope that our Presidency and the activities that we are implementing during this six months will not only increase the attention to science and research here in Slovakia but will also promote our results and our potential at the European level. This is something that we all will surely benefit from.

Peter Plavčan

Minister of Education, Science, Research and Sport of the Slovak Republic



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Foreword

Dear readers,

A well-functioning European research and innovation ecosystem for start-ups and scale-ups plays an increasingly important role in underpinning prosperity, jobs and growth. As the recent European Commission Communication Europe's next leaders: the Start-up and Scale-up Initiative highlights, too few European start-ups currently survive beyond the critical phase of 2-3 years, with even fewer growing into larger firms. This requires policy attention at all levels: local, regional, national and European.



A greater focus on innovation is one of the key features of Horizon 2020, but I believe there is more we can do to support our top innovators who have the ambition, resilience and capability to create and capture new markets. This will be all the more important as Europe's current industrial strengths are likely to be disrupted in the coming years by digital technologies and business model innovations taking place at the intersection between different sectors, technologies and disciplines.

I want Europe to rise to this challenge.

That's why the 2018-20 programming period of Horizon 2020 will introduce changes to provide bottom-up support targeting breakthrough innovation that will allow companies to scale-up more rapidly at the European and global levels, with a view to reinforcing this approach in the future through a European Innovation Council (EIC). I want further steps to be taken to simplify innovators' access to the programme and to help start-ups to connect with investors, business partners, universities and research centres. An EIC should enrich the European innovation landscape, complementing other Commission initiatives to stimulate greater availability of risk capital. The setting up of a pan-European venture capital Fund of Funds is an important step in this direction.

I would like to congratulate the Slovak Presidency for taking the initiative to publish these inspiring accounts of the journeys taken by innovative firms across our continent. These stories should encourage policymakers at all levels to redouble efforts to ensure that entrepreneurs have the necessary support to thrive in the years to come.

Carlos Moedas

European Commissioner for Research, Science and Innovation

Introduction

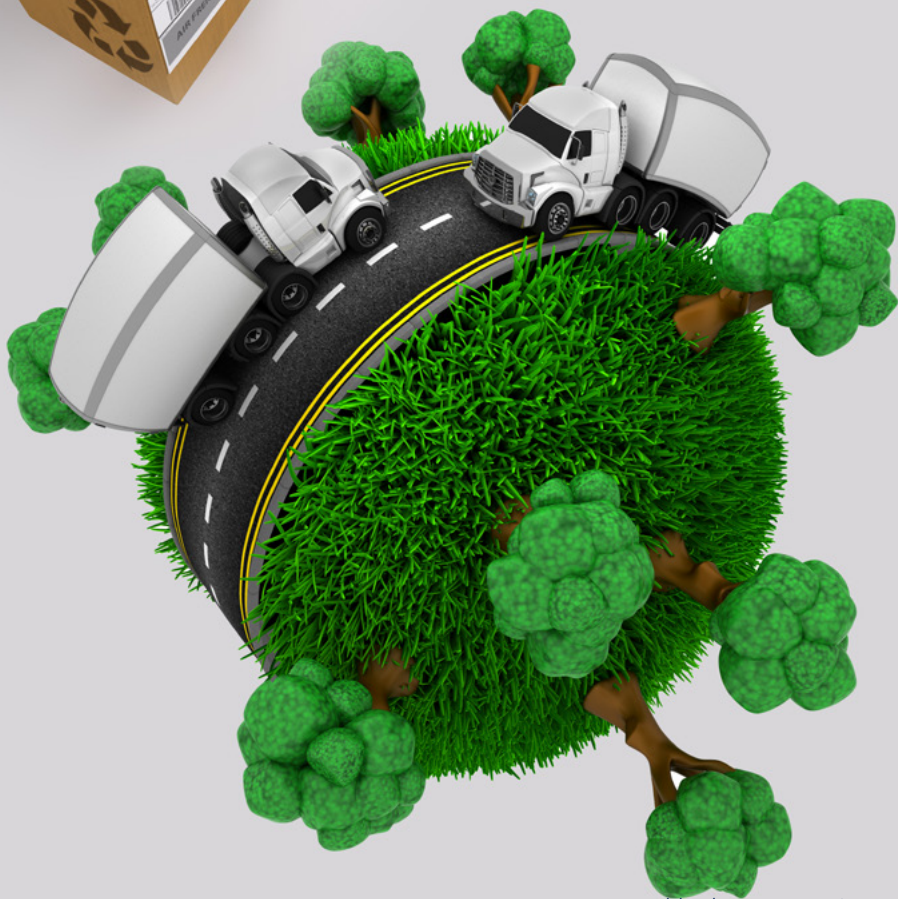
Today , the EU is stepping up to the challenge of insufficient and suboptimal investment into its economy and society'. With the emergence of new business models and industrial innovation, the EU and the Member States should not only adjust the regulatory framework to foster innovation, but also explore innovative ways of providing financial support and incentives for mobilising private investment, such as the European Fund for Strategic Investments, European Innovation Council (EIC) or the EU Finance for Innovators (InnovFin). Existing and emerging policy instruments and initiatives should help re-shape the current R&D&I spending models. In a portfolio approach, focus should include traditional R&D as well innovative products, services and processes.

The current amount invested by European companies in research and innovation is being outpaced by global competition. In comparison to the US, total private investment in R&D&I in the EU represents only 40% of US companies' investments. Investment in ICT and infrastructure for new technologies is another area in which the EU is losing ground to its global competitors. To close the accumulated gap in R&D&I and ICT investments with the US, the EU would have to invest EUR 335 billion more.

The Single Market has opened up new opportunities for European companies. Various supply and demand-side policy measures have helped to improve the framework conditions for doing business. The Commission's Single Market Strategy has a specific focus on SMEs and start-ups in many of its initiatives. In the context of the Better Regulation Agenda, calls have been made by both the Commission and the Member States to create a more research and innovation friendly regulatory framework that can adapt to the pace of change of new technologies and new forms of innovation, including by applying the innovation principle. On the research policy side, Horizon 2020 actively supports SMEs by providing both direct financial support and indirect support, creating a bridge between the core of the framework programme - support to research and innovation projects - and the creation of a favourable ecosystem for SME innovation and growth.

However, there is still more to be done to improve Europe's research and innovation ecosystem for SMEs, and in particular for start-ups and scale ups. The EU continues to perform relatively poorly compared to its major competitors in scaling up new companies and creating new markets based on disruptive, breakthrough innovations such as internet-based platforms or in the collaborative economy. On the latter, the recent Communication from the Commission aims to find a balanced approach so as to harness the great economic potential offered by collaborative economy business models while providing guidance on applicable EU law and promoting best practices regarding the regulation at national level, to minimise the risk of diverging regulations across the Single Market. As to the EU research and innovation support schemes, and despite recent improvements, stakeholders continue to call for further simplification of application requirements, the elimination of thematic restrictions, and for improvements in the evaluation process to allow for more bottom-up support for innovation. In addition, calls are heard for easier access to scientific information, embedding SMEs in knowledge exchange networks and increasing workforce skills to exploit innovations from elsewhere.

Extensive discussions are on-going on how to improve the European research and innovation ecosystem. One focus of the debate, in the context of the forthcoming mid-term review of Horizon 2020, is Commissioner Moe-
das's concept of a 'European Innovation Council (EIC)'. The responses to the Commission's "Call for Ideas" indicate that SMEs would benefit from an EIC that brings together, simplifies and fills gaps in the range of current EU innovation support schemes, including providing strategic advice. This should be done by tailoring support to the needs of SMEs and research teams at different parts in the innovation value chain, with full respect for the importance of basic research in driving innovation in the longer term.



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Metodology

In the context described above, the Presidency has approached the Member States with a request to identify in cooperation with their national experts 1 – 2 innovative start-ups / SMEs based or created in the respective Member State, which either is or has the potential to become a worldwide company. These entities were asked to answer the following questions:

- 1. What legislative or non-legislative bottlenecks at European or national level were most significant for you when you started scaling up from a start-up to become a global company?*
- 2. What European or national measures do you believe helped advance your research and your ability to scale up your business?*

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Austria

Name of the company:

BYRD



About the company:

Byrd is an Austrian logistics company that offers an effective logistics solution for e-commerce actors such as online shops or marketplace sellers. Customers connect their stores with byrd the software, which allows them ship items with one click. As soon as a pickup is requested, a byrd courier will pick up the items and bring them to the byrd warehouse, where they will be packaged and shipped. byrd is part of the TUW i2ncubator in Vienna, it has received a grant from the AWS Jumpstart program and is backed by Austrian VC Pioneers Ventures as well as angel investors KK Incube and Hermann Hauser.

Question 1:

A pain point that we have experienced was the foundation of our GmbH (Austrian limited liability company) which has been a very time- and resource consuming process. Especially as a startup with large investors there is a strong need for specialized lawyers who have experience in the local startup scene and can draft documents such as articles of association and employee option plans. This makes it a very long and expensive process, where specialized support for fast-growing companies (i.e. knowledge databases, stronger digitalization, recommended contacts) would help.

Secondly the Austrian government is very strong in terms of government support and financial grants. However what could be improved from our perspective is the cooperation between the government and investors from the private sector such as VCs or angel investors. Our national and international funding efforts so far have been

based solely on informal networks. If the link between public and private funding could be strengthened, it would further improve the startup scene in Austria and could even connect investors on a European level and help build a strong startup community.

Question 2:

We have received strong support from the TUW i2ncubator of the Technical University of Vienna which has provided us with a strong network of contacts in the startup scene as well as lots of mentoring and an excellent co-working space in the heart of Vienna. All these factors helped us grow while being able to rely on the support of our mentors. At the same time we have received a grant from the Austrian government (AWS Jumpstart) which has helped us develop and refine our product. In addition we are continually relying on the help of various Austrian institutions for our international expansion such as Austrian agencies abroad (Außenwirtschaftscenter).

Austria

Name of the company:

Braintribe



About the company:

Braintribe is an innovative software vendor with headquarters located in Vienna (AT) and main offices in São Paulo (BRA), Zürich (CH) and Berlin (DE).

Braintribe's latest product, tribefire, the Smart Enterprise Information Platform, was designed precisely to meet the challenges of the third era of enterprise IT and to capitalize on Big Data, Cloud and Mobility.

Question 1:

From a national perspective, finding enough qualified personnel resources is a major challenge. From an EU perspective, leveraging venture capital is the largest bottleneck during the transition from a small to an international company.

Question 2:

Obtaining funding was definitely a helpful building block for faster development. As far as human resources are concerned, it is the cooperation with other European companies.



Belgium



Name of the company:

Mazaro



About the company:

Mazaro has developed a new kind of transmission (Reversible Variable Transmission) that allows for:

- less CO2 emissions and lower fuel consumption through a more optimal use of the engine,
- better dynamics (immediate throttle response, no torque dip or efficiency reduction),
- higher driver comfort,
- more silent operation,
- engine downsizing,
- considerably less components than a classic transmission

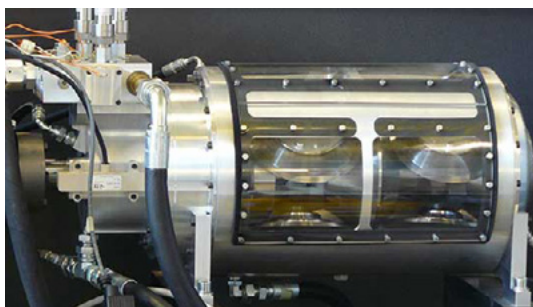
Question 1:

Legislative bottlenecks will probably appear once the first partnership has been finalized.

Non-legislative bottlenecks is the fact that almost all potential clients expect that the new product is being tested extensively in demonstration vehicles. For a small company, that is a huge investment. Fortunately, Mazaro has found one potential client that is willing to co-invest in the demonstration project.

Question 2:

Mazaro received funds from the Agency for Innovation through Science and Technology (IWT, now Flemish Agency for Innovation and Entrepreneurship). It also received funding through the SME-instrument under Horizon 2020, as well as a Seal of Excellence.



Belgium

Name of the company:

DNALytics



About the company:

DNALytics develops innovative data-driven precision medicine solutions (diagnosis, prognosis, treatment guidance) through partnerships with healthcare players such as pharmaceutical, biotechnological or In Vitro Diagnostic (IVD) companies. DNALytics wants its solutions to have a major impact on patients, healthcare practitioners and society as a whole.

DNALytics is a Belgian company founded in 2012 as a Spin-Off of the Catholic University of Louvain-la-Neuve (UCL) that bases its activities on a data mining technology platform. Aside from product (co)development, DNALytics also proposes its expertise in the form of a data mining consultancy service. In this context we serve various types of customers.

Question 1:

There are a lot of financing schemes in Wallonia and Europe to support research in the field of life sciences. Each year, large amounts are invested in an open innovation approach. But when a company finally develops a competitive service or product, there are rather few people to pay for it, even if it corresponds to a real need. In Europe, only few patients pay for their health care on their own. Therefore, in order to convince public authorities to buy our solution, we need first to validate our concept on a larger population, which is very expensive. Moreover, each Member State has its own funding/reimbursement policy, so the access to the European market as a whole in healthcare is a real hurdle for startups.

Question 2:

DNALytics received various awards, namely from IBM, Microsoft, the European Commission or the MIT, both for its technology and its business model. Moreover, DNALytics received funds from the Walloon Ministry for Research (SPW-DGO6) through a First Spin-off grant. Thanks to a project financed through the SME instrument (phase 1), DNALytics has been able to setup a large clinical trial project focusing around 1.000 patients. DNALytics had the agreement of hospitals in Belgium and France. The result of the project, if financed by the SME Instrument phase 2, should allow DNALytics to pursue its development in the European Union.

Bulgaria

Name of the company:
Dronamics



About the company:
 DRONAMICS is an aerospace startup based in Bulgaria, building a next-generation cargo airplane. Unmanned and extremely fuel-efficient, “The Black Swan” can carry 350 KG over 2,500 KM and has the potential to revolutionize trade by significantly lowering the cost of transporting goods by air, especially in emerging markets where demographic and economic growth is greatly outpacing local investment in the necessary road infrastructure. DRONAMICS are winners of Pioneers Festival 2015 (out of 1,600 startups from 98 countries) and are led by a multinational team with some of the best aerospace engineering and logistics experts worldwide.

Question 1:
 Unmanned aircraft is a relatively complex territory for regulators worldwide. Dating back to the Chicago Convention of 1944, unmanned aircraft has been left to be dealt with at the national level, which means there is the obvious risk of 190+ different sets of regulations worldwide which could severely slow progress.

Thankfully we see some convergence of ideas, but the challenge we have faced is that some countries move faster when it comes to regulations for unmanned aircraft, and this has particularly been the case outside the EU with governments in Africa, Asia, Latin America and Australia taking the lead. This presents a very real possibility that regions outside the EU will become a lot more attractive for developers and investors of unmanned technology who must do what’s best for their business and go where the opportunity is.

As an EU company we worry about the risk of Europe losing its lead in this emerging field, but we are also hopeful that this won’t happen, looking at how EASA is shifting to a more flexible model and will hopefully enable instead of hinder researchers, developers and commercial operators in unmanned aircraft. We, and other innovators we have spoken with, encourage such model and would like it be implemented as soon as possible, in order not to lose business to other continents and regions.

This goes way beyond our interests - numerous studies have shown the positive impact of unmanned aircraft in terms of becoming a multibillion industry generating hundreds of thousands of jobs in the EU and worldwide. If the EU moves with speed, determination and rational flexibility, prioritizing safety and economic and techno



logical progress, it could reclaim the leading place in the world that it deserves and our fellow EU citizens could be the ones enjoying the benefits and opportunities that this will create.

Question 2:

Our first funding came from a local startup accelerator, Eleven, that is funded by the EIF under the JEREMIE programme. This funding as well as the mentorship program and the ecosystem and community of other startups that were funded by Eleven as part of their acceleration program have been all critical enablers for our progress.

Croatia

Name of the company:

ALTPRO



About the company:

Company ALTPRO was established in 1994 and has over 20 years of experience in research, development and production of safety-signalling equipment for rolling stock and infrastructure. Based on the company's „know-how“ ALTPRO products have been fully developed and produced in Croatia and have proved their competitiveness on the global market. With its complete safety-signalling product range for rolling stock and infrastructure, ALTPRO is one of the few producers of such equipment in the world. Through a net of distributors and representatives, ALTPRO products are present on the markets of more than 45 countries on 6 continents. ALTPRO has developed and is currently manufacturing 900 different systems and devices - all its safety products have been certified according to EU standards by the independent assessment bodies such as TÜV Rheinland. Since the very beginning ALTPRO has invested in its most valuable resources-its employees, and today it employs more than 120 experts in the fields of research, development, engineering, production and maintenance.

Question 1:

The bottlenecks for our development are the homologation processes in some EU countries which are longlasting and not clear enough. These processes make doing business difficult for companies like ALTPRO. Consequently, that prolongs the development of new products and prevents companies from employing more people. EU institutions are passing the right laws in theory but in practice those are often hard to enforce. This is blocking new innovative companies from further development.

Question 2:

The introduction of CENELEC norms helped us on a global level. Our products are developed according to CENELEC norms and certified in leading EU certification institutions. The certificates we have are recognizable in all 46 countries where ALTPRO is present. This is a big factor for us globally. We also expect that thanks to EU research and development funds, we will develop even more innovative products for the global market. Often companies have difficulties with development funding and these funds are something that makes the required goals easier to achieve.

Croatia

Name of the company:

AMPHINICY



About the company:

Amphinicy is a provider of complex tailor-made software solutions and all-around software support for the satellite industry. The company has been on the market for more than 20 years. From its beginning, Amphinicy has delivered over 100 projects to the international market. Their customer base includes international space and humanitarian agencies (ESA, German Aerospace Centre DLR, UNHCR), leading satellite operators and global satellite service providers (SES, Airbus Defence and Space, O3b Networks), teleports and space mission operation centres (Redu Space Services), satellite equipment manufacturers (iDirect, Newtec) and other important stakeholders in the industry. The company operates from two offices - Zagreb Office, the headquarters, a company registered in Zagreb, Croatia, and Luxembourg Office: for more efficient cooperation with international customers mostly located in Western Europe and Benelux region.

Question 1:

Space/satellite industry is global industry by its nature, so even before Croatia became an EU member, Amphinicy (AT) was operating globally. The main issue for AT before entering EU was free labour movement – we had to follow complicated procedures to allocate employees in customer's premises for long-lasting contracts. Upon joining EU this became a straightforward practise, but now Croatian law is making the process a bit difficult by limiting working abroad to a one month period (otherwise special tax applies). Furthermore, as a young EU member, it took some time for Croatia to adopt best practices related to promoting and helping SMEs with EU programs and grants, as well as making structural funds available, but this is getting bet-

ter. With Smart Strategic Specialization document adopted, the government is finally aligning all the investments institutions to support the same strategic goals. Another thing that would help Amphinicy in global reach is Croatian accession to ESA (European Space Agency). Croatia is, for the time being, the only EU state without ESA member state or cooperating state status.

Question 2:

Croatia is still a young member of EU family. Therefore it took Amphinicy some time to see how we can benefit from being part of overall European strategy. Because Amphinicy is an SME, and have been recognised several times as innovative company by some national and international agencies,

we have put a closer look at Horizon 2020 program that encourages innovation in EU. Therefore, we have submitted (and successfully got a grant) for H2020 SME Instrument Phase 1, with the highest score in the category, and are now waiting for results of Phase 2 call. Besides bidding for H2020, we have our profile of EEN (European Enterprise Network) and have been contacted by several organisations, including EU-Japan Partnering support Mission in the Space Sector, where we

were shortlisted as representative of SME space sector in EU. Amphinicy has also been invited as a presenter/panelists to several Space conferences (e.g. Toulouse Space Show 2016) or info-days organised by EU institutions where we have met relevant stakeholders from the EU industry. Amphinicy already has a global customer base, and strengthening position in EU, by being part of consortiums boosts our international growth!



Cyprus

Name of the company:

Covve



About the company:

Covve revolutionizes the way professionals network by empowering their traditional address book. It uses innovative relationship management features to ensure you never lose touch with your contacts and allows you to stay on top of every conversation, acting like you own personal CRM. Covve also offers sophisticated contact management features to complete, organize and visualize your contacts. It allows private sharing of contacts between colleagues and trusted networks, facilitating warm referrals and introductions. It's being used thousands of business professionals as well as Big4 business services firms and recently MBA alumni. We see Covve being the first port of call for business networking and the tool of choice for professionals who are serious about their contact network.

Question 1:

First let me clarify that we only recently started scaling internationally, so many of the challenges are just materialising. With privacy being a fundamental aspect of our business and with the EU Data Privacy Directive coming into force, we had to ensure we take all the necessary steps to be in line with the regulation. On the non-legislative side, as a very R&D-heavy business, we had to face the realities of raising capital in our region. Venture focussed institutional investors are non-existent and there are very few angel investors with awareness and appetite in venture.

Question 2:

We have received an EU entrepreneurial innovation grant early which helped cover part of the cost of our R&D. However, we did encounter delays in the approval and disbursement of the grant which impacted our cash flow. Recent, potential measures to encourage angel investing through tax incentive schemes will make a huge difference in local investor appetite and allow for companies to reach the stage required to tap into international funds.

Cyprus

Name of the company:

Engino



About the company:

The ENGINO® TOY SYSTEM is the most versatile building system in the market today as it allows connectivity in all directions of the 3D space with the minimum number of parts. Since 2007, when the first products were launched in the market, the company experiences steady growth reaching now a presence in more than 15 countries. The product received numerous local and international awards such as the Best Educational Toy by Dr. Toy in the USA, the innovation award by Cyprus Industrialist Association and Best Practice SME by the EC.

Question 1:

Funds are granted only for Research & Development and not for launching thereafter the innovative products in the market. This is one of the biggest problems we are facing because our growth is slower or we lose a lot of opportunities or we are financially weak to stand next to strong competition. A new product must be communicated in the market correctly and on-time and that requires sufficient funds in various types of marketing and human resources.

Engino is an international company and fairly competes with other big international companies. Unfortunately, the amount of funding we receive is small enough (perhaps due to the small size of Cyprus or other reasons) to open big projects and finish them in short time, so sales always begin late and that ends up to lose opportunities and potential revenue and have longer payback period of investment. Assuming that our big rivals receive much higher funding and support, that put

us in a disadvantaged position.

Last but not least, there are no export related subsidies. For many years, toy buyers and consumers have a tendency to buy Asian products because of lower cost, hence it has been difficult for us to enter the price sensitive markets. Like China subsidizes their exports, EU should have given more incentives to local manufacturers to allow them reducing their cost and being more competitive.

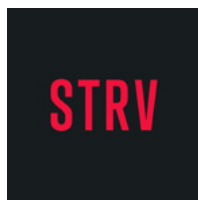
Question 2:

We received funding from the Research Promotion Foundation in Cyprus for various projects in the past and that supported us financially at least to start the development of new innovations and gradually complete the projects and promote them in the market with own funds. Especially in the early years of Engino start-up, funding was crucial and key factor to sustain the business until the product is optimized and be able to generate sufficient sales and be autonomous financially.

Czech Republic

Name of the company:

STRV



About the company:

STRV is a top-tier, one-stop mobile app and web development shop working with top-tier startups and brands. Since 2004 STRV have developed hundreds of apps for iOS, Android and web. With 100+ rock star developers and designers on the team and five offices in the US and Europe, STRV is the preferred partner of dozens of companies which benefit from high-quality code, sleek designs, and super fast turnaround.

Question 1:

The biggest bottleneck concerning legislation was the difficulty of operating two separate organizations, the Czech one, and the US one, as one company. And setting up a good model of cooperation between the two entities.

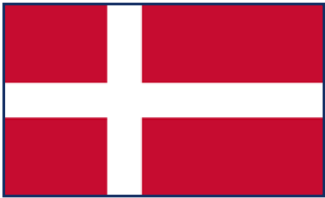
Question 2:

What helped us to scale up the business was participation in the CzechAccelerator program that supports companies to expand their reach to international markets. In our case, it was Silicon Valley. Today our US sales are nearly 100% of our revenue, and it would be certainly harder to enter the US market without the support of CzechAccelerator which is part of Czech Invest.



Denmark

Name of the company:
CumulusBio



About the company:
Cumulus Bio tests and develops advanced bio- and renewable hydrocarbon products, such as chemicals, and fuels and lubricants intended for the transport sectors. Cumulus Bio work at the intersection between life-science, chemical engineering, and material science to service developers of technology products and technology platforms. Cumulus Bio specifically assist in the early stage characterization, qualification, and R&D of diverse carbon and hydrocarbon products, with a special emphasis on biofuels.

Question 1:

We have found the following legislative and non-legislative bottlenecks in no particular order.
In general we find that there is a widespread funding bottleneck for early stage hightech development, when comparing to technology clusters such as Silicon Valley and Boston-Cambridge. While some amendments have been made to meet this problem in several of the new Horizon 2020 programmes, that gap is still large.
In high-tech development, there are important differences between physical product development (e.g. hardware, chemicals, materials, etc.) and virtual tech products, that can easily be downloaded and installed without complicated approval and production procedures. While the average time to market for most IT products is less than three years from idea to market penetration, the average time to market for physical high-tech products can easily be 10-15 years.

Many early strides in technology development, specifically basic research, e.g. in physics, chemistry, biotech, and more, are traditionally carried out at Universities and other public research organizations. Yet, universities are generally unable to mature and commercialize new technologies. On the other hand, large international corporations can successfully produce and commercialize high-tech innovations, but they are inefficient in high-tech R&D, specifically early stage development (also known as 'the fuzzy front end of innovation'). This makes SME's an indispensable source of maturation for high-tech inventions, which is why dedicated funding hightech funding programs have existed since World War II. Collaboration between Universities – SME's – and large international corporations are the norm for most high-tech sectors. These collaborations are not substitutes for one another, but rather complementary under the right

circumstances.

But while startups in the Silicon Valley and Boston-Cambridge clusters have access to dedicated non-equity-diluting SME funding programs, which cover 100% of the companies direct costs, as well as 100% of the companies indirect costs, as well as an 8% overhead for 'unforeseen circumstances', EU programs and national European programs generally only cover a variable percentage of SME's direct costs, and, for most programs, require that the SME's comply with de minimis aid rules. In comparison, US programs, like the SBIR (Small Business Innovation Research Program), are instrumental for the first years of successful high-tech startups. Examining investment portfolios from top US venture capitalists reveals that most of the non-IT high-tech investments are made in startups, which have already received several grants of USD 2-3 Mio. In comparison, EU competition rules dictate that European high-tech startups either remove focus from R&D to generate a cash-flow on the side, or to engage with equity investments long time before the product development reaches a TRL level that allows investors a return on investment within a reasonable time-frame.

This funding structure allows startups to apply for funding based on merit, with out any partners. Currently, public-private partnerships are the norm for many R&D grants; often with the stipulation that the grant be governed by an academic institution (e.g. requirements that the Principal Investigator be a professor with a certain academic pedigree). This often diverts group or

consortium attention towards basic research (which is the nucleus for the University partners) and removes focus from creating and maturing viable real-world technologies. These structures should be amended to place focus on technology maturation and (eventually) commercialization.

As a result of the large divide in early high-tech development funding, many promising EU technologies are never properly matured, and do not reach market.

European legislation on R&D funding should support the fragile early stages of R&D, like it is done in the US. Ideally cutting back on the burden of bureaucracy (e.g. by letting national organizations govern the funding programs). Bureaucratic documentation and reporting practices are particularly challenging for small firms.

Apart from the intricacies of funding legislation, the uncertainty on future legislation, and dynamic alterations in existing legislation, also plays a large role for our type of startup. This can be various types of legislation, such as environmental legislation (e.g. CO₂, and other emissions), requirements for sustainability, toxicology and safety, and more. Such legislation has great impact on physical products, which must be tested and approved before they can reach the market (and can not be easily downloaded via the Internet). While it is natural that legislation be updated based on accumulated knowledge, also of new technology markets, stable and reliable legislation is of absolute importance. Specifically legislation can not be fully dynamic and always changing for new technol-

ogies with long developmental times (e.g. hardware, chemical development, advanced materials, life sciences, and more). The consequence of such is increased resource consumption and extended developmental time for startups, as well as general discouraging of investors and collaboration partners. Finally, it's our experience that a culture of government funded 'coffe-drinkers' has emerged, much to our bemusement. We hear the same from partners in other EU countries. In short, the volume of governmental startup counseling and facilitation offers is disproportionate with its actual usefulness. While we appreciate that many European countries have made it a priority to help entrepreneurs through publicly funded counseling, pitch training, sales courses, startup competitions, and more; the specific usefulness is often very low. As is natural when government project workers and case administrators without any experience or knowledge in creating or managing high-tech startups suddenly act as advisors in the field. Always with the promise of a hot cup of coffee for the entrepreneurs. While coffee is great, it's usually not what gets the company traction, in our experience. Many of the resources spent on these initiatives could, advantageously, be spent supporting the startups themselves, rather than unneeded and unwarranted public advisors. Or at least be concentrated towards the organizations such as granting agencies, which have ample experience within the field of high-tech R&D.

Question 2:

In our experience, the Confederation of Danish Industries has been very helpful indeed. Not only did they provide us our first seed funding, which enabled us to create the scientific results needed for our next funding step. But they have also been instrumental for our early legal business management advice, as well as a great facilitator of network and knowledge via their thematic meetings (e.g. the annual meeting for the Danish Energy Sector). Innovation Fund Denmark provided us with our first large consortium grant, and has been very forthcoming in several ways. We like their new integration of business professionals, and hope to use these services more in the future. Unlike many public offers, Innovation Fund Denmark has ample insight, experience and network that we find beneficial. And while we would like to see non-partner SME grants for R&D, similar to the SBIR structure, we also recognize that the European cross-boarder funding programs (e.g. Horizon 2020), and national/ regional objectives of international and inter-European collaboration creates intriguing partnership opportunities. Particularly when it is sanctioned that SME's must participate. This has resulted in several partnership introductions that we would have had to work a lot harder to achieve had this framework not been in place.

Estonia

Name of the company:

Cybernetica



About the company:

Cybernetica is an R&D intensive ICT company that researches, develops and manufactures mission-critical systems, light signalling and telematics products, maritime surveillance and radio communications systems. Cybernetica has been an active counterpart in developing critical e-Government systems, such as the Estonian X-Road, i-Voting, e-Customs and others.

Question 1:

Cybernetica's information and marine security technologies are in constant demand. However, we have seen an increased interest towards our Sharemind privacy technologies, developed in the Sharemind R&D unit which acts similar to an in-house start-up, due to the new General Data Protection Regulation and the European Court of Justice verdict on the Safe Harbour agreement. Both of these changes have created an increased awareness of practical privacy technologies such as Sharemind. And what's best - this awareness has also developed outside the European Union. Organisations in, e.g., the United States of America are paying more attention to the privacy story they tell about their product and this is exactly where Cybernetica and Sharemind can create an advantage.

Question 2:

European Commission Framework Programmes (FP7, H2020) can be very beneficial for an SME who is committed to bringing its vision into practice. The main challenge is in picking the right partners who share this vision and want to build practical solutions for the European community by utilising excellent science. We have found regional measures helpful for R&D targeted towards creating a local impact that can later be scaled up using additional investments.



CYBERNETICA

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Estonia

Name of the company:

Starship



About the company:

Starship is developing self-driving delivery robots, which are slow autonomous vehicles that will deliver packages quickly and economically while using underutilised sidewalks. Starship reduces the ecological footprint of delivery and non-recreational private shopping dramatically while it also helps to minimise congestion related to deliveries.

Question 1:

Areas that are relevant legislative topics to us in different markets (not necessarily only in Europe) are:

- * operating autonomous machinery in an outdoors environments
- * operating lightweight electrical on sidewalks
- * regulating right of way on unregulated intersections
- * simplified land use to deploy automated containerised warehouses

In conditions of constantly emerging technology that has just become feasible defining specific technical requirements in regulation will impede innovation. There are cases where legislation may be overly narrow and prohibits any sort of vehicle from operating on sidewalks regardless of their speed, mass and other characteristics.

In some cases, there is also an unreasonably high technical burden that in certain cases lumps basic passenger cars together with a small plastic lightweight vehicle that goes at pedestrian speeds.

Question 2:

Legislative areas that have helped Starship advance our business are mutually recognised certification bodies, banking regimes and standardised product and machinery requirements (assuming they reasonably limit their scope). Or in the case of machinery, efforts that define a framework in a forward-looking way that will allow for solutions significantly different from current ones that will be unlocked by new technology tens of years in the future as long as the solution forms a whole in its context.

Finland

Name of the company:

Kyynel Ltd



About the company:

Kyynel Ltd. has successfully developed a unique long-range communications system called KNL Networks during 2011 – 2015. This revolutionary service is developed to solve the communication issues of maritime sector, the biggest transport sector globally. Currently around 90% of world trade is carried by the international shipping industry. At the same time missing or insufficient communication in shipping has been identified as one of the biggest issues in industry.

Question 1:

There have been surprisingly few actual bottlenecks on our scale-up process. As we are both a radio-house that manufactures our own radio devices and a service company acting as a telecommunication operator on maritime sector, the legislative aspects had to be taken into account from the very early phase. The radio device type approval and certification process took quite lot of attention, time and money from the company. During that process A Finnish "notified body" that conducted the actual approval process managed, with co-operation of the company, to go through with the complex certification process without any major issues. Furthermore, the Finnish Communications Regulatory Authority has enabled a quite fluent access to the international radio spectrum licenses with their legal processes.

The bottlenecks, just to mention some, have not been legislative but rather only have considered technical aspects of our research and development. Any

of those haven't considered any European or national level aspects.

Question 2:

Through their funding programs the Finnish Funding Agency for Technology and Innovation (tekes) had been one of the major outriggers during the company's road ahead. The Business Oulu, (an enterprise owned by the City of Oulu, who is responsible for implementing the city's industry policies and providing companies with development services) have been in a serious supporting role especially during the first steps of the company. Other supporting public sector entity to be mentioned is the Foundation for Finnish Inventions.

The active investor ecosystem in Finland has helped to raise the necessary seed money for the company. The seed investing round was preceded by a Finnish business angel investment. The further investing rounds have been enabled on European venture capitalist pool by the networks of the

representatives of the Finnish investing funds. Thus, the venture capitalist friendly national and European level atmosphere have been in paramount at the process of collecting the funds for the scaling-up of the company.

From the research and development perspective the most important enabler has been the absolute high level of the academic research, the university education (producing the talented

engineers) and the whole telecommunication ecosystem in Finland, particularly in Oulu area. The competence rich ICT (information and communications technology) sector in Finland / Oulu area have also been a key enabler for development of the comprehensive telecommunication system solution the company had successfully introduced to the market.



France

Name of the company:

PLATFORM.SH



About the company:

Platform.sh is a continuous deployment cloud hosting solution for web applications.

Platform.sh is a VC-backed startup headquartered in Paris, with three fully owned subsidiaries and employees based across five continents. In its two years of activity it has seen explosive growth acquiring thousands of clients from more than a hundred countries, notably in the United States and Europe. Among its key client accounts, you can find Vivienne Westwood, Reiss, the Canadian Football League, the British Council, Parc Asterix, Seloger.com, Flixbus, and El Univer-so.

Question 1:

1) Instruments that can decrease the overall administrative costs are essential for investment in R&D. This is in particular the case for two French instruments: the "Young Innovative Enterprise" status and the R&D Tax Credit. However, they also represent an additional management cost and there is some risk inherent to them (an audit for the tax credit can cost the equivalent of one-month productivity for 1-2 people, generally leaders of the company). The interaction with other instruments such as national or European grants is rather complex, as the eligibility rules differ quite a lot between those instruments. Definitions that are used often come from the industry sector but they do not adapt well to other sectors: the distinction between "research prototypes" and "industrial prototypes" makes no sense in many domains of new technologies. This is the same for the definition of a project that would not have been star-

ted yet, as all steps are imbricated. A prototype is often hard to distinguish from the initial product (the so-called Minimum Viable Products).

The high number of instruments forces young companies to devote too much time in the investigation and management of all applications, which leads, in particular for collaborative projects, to the creation of projects that are not fully in line with the company's needs. In our view, the majority of collaborative projects that we have seen (both at European and national levels) are concerned by this situation. Part of the investment goes to actually productive tasks but some actions will translate into deliverables that will be soon forgotten.

When it comes to companies that have an early international development, this becomes even more complex (costs for an employee from an American branch may not be eligible, while an American consultant may be, even if

both work on same R&D activities). This is linked to potentially conflicting policy objectives: there is a mix between a support for European companies in order to make them grow quickly (which will eventually have positive effects on employment) and short-term actions to generate local jobs.

2) The complexity and relative rigidity of labor regulation is an issue. A company that has not found its direction yet needs at the same time to hire people that can stay for a long time (and try to make them stay) but also to be able to change direction quickly when necessary. The French process of “mutually agreed termination of contract” has helped but it is probably not enough for start-ups.

3) Despite strong elements of attractiveness (such as social security in France, but also excellent technique and quality of life), it is very difficult to hire people from outside Europe. There is still a lack of concrete and operational measures to fight the brain drain. Our start-up succeeded in hiring a senior engineer from one of the big American internet companies, but it was a burdensome process and there

is still a possibility that the administration says “no” at the end of it. This is also true for experts from EU Member States. With the development of telecommuting, we would have liked to easily hire people from outside of France. But after having examined the very complex process of hiring somebody from Sweden for instance, we dropped the idea.

Question 2:

As already said, several instruments – including R&D programs, contests, etc. – such as the R&D Tax Credit and the Young Innovative Enterprise, are absolutely necessary in order to be able to consider competing with countries in which labor market regulation allows companies to launch their development with a more pragmatic approach (but with a similar labor cost as salaries are higher). However, those instruments imply a work overload that reduces productivity and reactivity. That is why we consider that the SME Instrument in H2020 should be taken as a model as it is less complex than similar tools while at the same time providing similar guarantees on the proper use of public resources.

France

Name of the company:

HifiBio



About the company:

HiFiBio SAS was incorporated in 2013 (currently 19 employees) and founded by world opinion leaders including Prof. David Weitz (Harvard), Prof. Andrew Griffiths (ESPCI, Paris) Prof. Jérôme Bibette (ESPCI, Paris), Prof. Brad Bernstein (Harvard, Cambridge, USA) and Dr. Rob Nicol (Broad Institute, Cambridge, USA). The management team consists of Fred Dom, CEO (serial entrepreneur), Dr. Colin Brennan, COO (serial entrepreneur) and Dr. Allan Jensen, CSO (ex director Pfizer, Symphogen).

Question 1:

Lack of flexibility of labor regulations (working hours, termination of contract)

The possibility for stock-options to employees of the company is complex, tax is high, and the acquisition after a certain period of time is a negative incentive

Contracts with international investors have to be French, which is very uncomfortable

Common national business regulations are too heavy for a start-up

Question 2:

The "Young Innovative Enterprise" and the R&D Tax Credit were important for the development of the company

Grants (the "creation/development contest" organized by the Ministry of Research and Innovation; R&D grants from ANR - the National Research funding Agency; and the CIFRE mechanism that is a joint doctoral training between a public laboratory and a private company) were important for R&D activities.

Germany

Name of the company:



BioNTech



About the company:

BioNTech AG was founded in 2008 by the clinical scientists Prof. Dr. Ugur Sahin and Prof. Dr. Christoph Huber as a spin-off of the prestigious Johannes Gutenberg-University Mainz, Germany. The Company is founded on years of pioneering work and accomplishments include groundbreaking innovations for identifying ideal cancer targets, award-winning immunotherapy technologies, and a broad patent portfolio. BioNTech has grown rapidly to 500 employees with the majority of these engaged in the laboratories. Their research headquarters are based in Mainz, Germany.

Question 1:

BioNTech experienced no major bottlenecks or difficulties during the scale-up phase. During application processes for European funding opportunities we experienced some difficulties and delays regarding the coordination between the EU and the national contact to clarify questions concerning the national implementation or special needs.

Question 2:

BioNTech's spin-off of the University was enabled by national measures of the German Federal Ministry of Education and Research. Further, to implement and establish the Company's innovative and novel R&D programs

consecutive financial funding were of decisive importance. The European Union, the German Federal Ministry of Education and Research (BMBF) and the regional government of Rheinland-Pfalz offered funding opportunities both separately and across the institutions which made it possible for BioNTech to advance its technological findings and to expand the business. Through these programs and the national and international consortia partners involved, BioNTech was able to establish a network of partner institutes and expert to discuss chances and challenges and advance our innovative concept.

Hungary

Name of the company:

QuantisLabs Ltd.



About the company:

QuantisLabs Ltd. (founded in 2005) has gained considerable experience in remote sensing and agro analytics (collecting, transferring, processing and analyzing large amount of real-time and on-site data sets). Combining agriculture and IoT (Internet of Things) knowledge resulted in the success of the company's flagship project, SmartVineyard, a precision viticulture sensor network. The solution intends to address the challenges of grape protection directives by allowing remote plant disease monitoring and comprehensive decision support with on-site sensors an intuitive, web based user interface. Automated predictions of fungal diseases, and microclimate monitoring supports agriculturists in producing the highest quality crop with minimalized yield loss. Due to a network of compact measuring devices on cultivated areas, viticulturists are armed with precise, individualized data and recommendations and helped avoiding intuition based decision. All measured data and relevant information can be accessed on an ultimate agro-intelligence dashboard. Accurate, real time information helps farmers decide when and where to spray and neither its installation nor its utilization requires any specialist technical know-how or experience. By applying the solution, viticulturists could stop superfluous use of expensive and environmentally harmful agents while streamlining performance. The solution is already commercialized and currently used by dozens of viticulturists in Europe.

SmartVineyard solution has been awarded as the Best Agro Innovation in Hungary in 2014 and ranked about the top 10 innovations at Intel Global Challenge in California. SmartVineyard project has received a Horizon 2020 SME Instrument Phase 2 grant worth €1 million from the European Commission in 2014. The funding is used for scaling up the SmartVineyard system to become fully operational by developing precision sensors and adapting the monitoring system for additional plant cultures.

Question 1:

High level of complexity in accounting and tax relating issues at national level. EU funding involves cash flow challenges and significant level of extra bureaucracy.

Question 2:

Equity free EU funding provided significant amount of cash to fuel the research and development and finance engineering positions.

Latvia

Name of the company:

Koatum



About the company:

Koatum is a medtech startup, born in Riga in 2014. The company focuses on creation of unique hybrid multi-layered coatings for dental and orthopedic implants, serving to reduce patient healing times, remove direct metal-to-tissue contact and create tailor made solutions for specific purposes. Koatum's coatings are very thin, flexible and can be modified according to the clinical need, including impregnation with antibiotics, coating of complex 3D printed structures and sputtering of ceramics and polymers, too challenging to accomplish with the existing methods. Currently, the company has finished its pre-clinical trial phase, is seed invested by Imprimatur Capital Seed Fund (Riga, LV) and will move into the human phase shortly.

Question 1:

For every startup, the time is crucial when it comes to scale up. Hi-tech startups also tend to be cost-intensive and have longer life cycle, which amounts to bigger costs of pivot or any R&D, which might come required after iteration with the industrial partners. The biggest EU-level bottleneck is, therefore, the inability to attract fast research funding. While EU features a variety of hi-tech support instruments, such as ERA-NET and Horizon 2020, the funding often cannot be obtained quickly enough to sustain the growth of a startup. Due to this, innovative SMEs still opt for venture funding.

Question 2:

In terms of national measures, Latvian Investment and Development Agency is the one providing substantial help to young SMEs, reimbursing certain travel expenses, as well providing relevant info on industrial events, EU instruments such as H2020, etc. On the European scale, common market is clearly the major opportunity for a hi-tech startup to utilize. We are freely working with partners all over Europe, which clearly widens our scope in terms of development and future clients. Additionally, EU provides clear unified certification guidelines for all medtech products, which spares time meeting specific national regulations.

Latvia

Name of the company:

Edurio

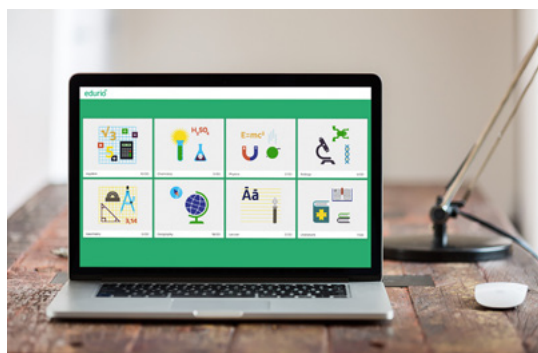


About the company:

Edurio helps education organizations get the hidden insights on the quality of education by collecting and analyzing feedback surveys from the learners, teachers and families. Edurio is used by over 200 schools in Latvia, Finland and the UK to collect responses to over 3.5 million feedback questions. They also work with organizations like Oxford University Press, UCL Institute of Education and the Ministry of Education of Latvia to contribute to education quality improvement across Europe and globally.

Question 1:

As Edurio expanded into doing work in the United Kingdom and attracted investment and partners there, we had to set up a UK legal entity. Since then the accounting, transfer pricing, tax and IP has been a major time drain for the team. Start-ups are starting to have more complex and global legal structures and most EU countries are not yet ready to streamline those relationships



Question 2:

Edurio was boosted by both EU structural funding via the JEREMIE programme, managed by the Imprimatur risk capital fund in Latvia and Horizon 2020 funding in the SME instrument Open Disruptive Innovation scheme. Collectively these programmes have contributed over 2 milj. EUR to Edurio's product development and allowed us to rapidly grow the team. This was supplemented by local small enterprise tax breaks and export event support. Without this mix of European and national support we would not have been able to rapidly develop our web platform and deploy it at scale.

Lithuania

Name of the company:

Altechna R&D



Workshop of Photonics

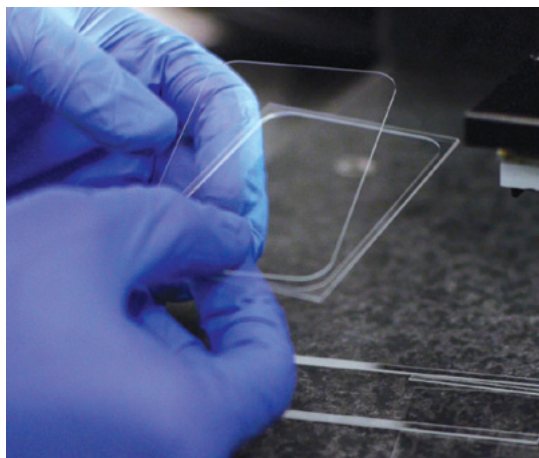


About the company:

Workshop of Photonics (www.wophotonics.com) is an Altechna R&D brand dedicated to laser micromachining solutions. The Company specializes in several fields ranging from feasibility studies to laser micromachining workstations and state of the art technological solutions for industry applications. Since 2007 Workshop of Photonics has been heavily investing and carrying out extensive research and development in the field of femtosecond laser micromachining. The Company most closely works with semiconductor, medical, photovoltaic and other industry players. Workshop of Photonics follows the open innovation culture and relies on a vast network of laser sector companies, universities and worldwide partners to find new applications and growth avenues.

Question 1:

Dual-use export regulations affect research and development at SMEs by causing a delay in order processing due to lengthy realization of procedures. This does not comply with rapid technological and scientific developments, and transformations in global economic relations, and makes significant bottleneck to SMEs, which are working in laser micromachining area.



Question 2:

Workshop of Photonics participate in EU programs, which are designed for R & D activities, personal training and export promotion.

Seventh Framework Program (FP7): The APACOS project created solutions for the automated assembly of laser systems. Two European SMEs from the laser manufacturing industry, Modulight and Workshop of Photonics, developed novel laser sources with high market potential. Developments were supported by the Optoelectronics Research Centre at Tampere University of Technology.

Significant financial and technical assistance was given to Workshop of Photonics in the field of protection of intellectual property rights. This is a national program supervised by Agency for Science, Innovation and Technology of Lithuania.

Lithuania

Name of the company:

Deeper

deeper



About the company:

At Deeper, we believe in breaking new ground every day. We take objects used in sports and outdoor activities and transform them into cutting-edge smart devices. Our Smart Sonar was the first ever wireless echo sounder for iOS and Android devices. A winner of 10 innovation awards globally including at the CES 2016, it is now sold in over 50 countries. Constant feedback from our team of pro-staffers, and from our customers, helps us to continually improve our products. And, following this approach, we hope to revolutionize urban cycling with our new product, the Deeper Lock, just as we have transformed fishing.

Question 1:

In terms of legislative bottlenecks, two can be identified.

Firstly, intellectual property was an issue. The process of gaining a patent applicable across the EU proved timely and complex. We had to register our patent nationally, then apply for a PCT before rolling the patent out to each member state.

Secondly, whilst standardised certification works well in some areas, as a designer of innovative new products, gaining certification that applies across the EU has proved challenging for some of our products. For our latest product, a smart bike lock, it is currently not possible to gain safety and quality accreditation which is accepted and recognised across the EU. Indeed, some accrediting authorities are not even prepared to test our product as it does not fit with their idea of how such a product should function. So,

whilst getting our product to market is straightforward, proving its quality to our customers across the region is more difficult.

More generally, there is also still the variation from country to country within the single market in their rules, systems and procedures. Variations in taxation, and rules on warranties and packaging information, for example, all slow down the process of scaling within Europe, and in some cases drive up costs.

In terms of non-legislative bottlenecks, we have encountered many.

As a company that uses innovative marketing approaches across a range of channels, one major challenge has been localisation, both culturally and linguistically. Producing quality content for a diverse range of media, then translating it and making it relevant

for each locality, is expensive and time consuming.

Similarly, in terms of sales, we have invested a lot of resources and effort into finding local distributors in each EU country. With only one Europe-wide trade fair relevant to our first product (a smart sonar for anglers), we have had to attend numerous national and sub-national trade events to find the right distributors and retailers for our products.

Linked to this issue has been a general lack of data when entering a new market within the EU. A centralised pool of data relevant to our products (eg. number of users, outlets and retailers, cultural specificity, climatic and seasonal variation) for each country would have made entering each individual countries simpler and quicker.



Question 2:

Notwithstanding the above point regarding certification, in most areas gaining certification for products within the EU has proved simple and quick. Scaling up within the EU is also much more straightforward than other regions, thanks to the absence of customs and the ability to use the same certification in many countries.

With regards to costs, two European measures have had a positive impact. Firstly, as borders have opened, the cost of logistics within the region has reduced. Secondly, being a part of the Eurozone means lower banking costs, and generally faster transfers.

As a company we received combined funding from our national government and the EU to support us in acquiring export certificates for a number of markets outside the EU.

One of the qualities that is hardest to quantify, but definitely of great importance, is the confidence we gain from knowing we are operating within a unified single market. Whilst it varies a little from country to country, the legal framework is still consistent and predictable. This supports a more general sense that business partners within the EU are people you trust and understand. This sense of cultural similarity is very valuable and important when entering a new market.

Luxembourg

Name of the company:

Airboxlab
(Foobot)



About the company:

Foobot is IoT device to monitor indoor air pollution and taking control over the air treatment system to deliver 24/7 fresh and clean air for the working and living spaces.

Question 1:

The Internet of Things disruptive technology can be very easily deployed worldwide as it provides a software based data processing service on localized servers with plug & play environmental sensors. When focusing on the B2B markets to embed this technology into existing ones, the adoption curve is slower than expected due to regulation of each European market. National leading companies are capitalizing on the local regulation to keep a tight hold on their market, thus postponing the adoption of new technology. Whereas in the US, companies can create a new standard and turn it into a future regulation.

Question 2:

The JEI (Jeune Entreprise Innovante) programme was definitely the best measure for a Hardware Startup like Foobot to boost the emergence phase which requires working capital to finalize a product which combines market fit and production cost. The Luxembourg JEI was extremely relevant and powerful as it was considering the whole start-up elements as innovation and not just the R&D of the product.



Luxembourg

Name of the company:

All Square



About the company:

All Square uses the latest social media and app technologies to harness the passion for golf on a community level. Our startup's ambition is to become the world's leading marketplace and social network for golfers, a platform through which the world of golf will become more open and connected.

Question 1:

All Square Golf has a global market. For us the major bottlenecks we experienced was hiring abroad and trying to keep a small structure with no subsidiaries.

Question 2:

The JEI (Jeune Entreprise Innovante) programme was definitely a very good leverage to attract private investors. It provided us with a 450 k euro subsidy in an early phase of development of the company.



Netherlands

Name of the company:

Black Bear



About the company:

Black Bear provides a circular solution to extract high value raw materials from waste tires. Each year, more than 1 billion tires reach the end of their life. Furthermore, production of new tires is very polluting. Black Bear provides a circular solution to these problems with our innovative technology, which enables us to harvest raw materials from end-of-life tires that can be reused in production of new tires, rubber, ink and paints. Each Black Bear line saves more CO2 than 1 million trees can consume! Our first line in the Netherlands is ramping up production towards the end of 2016. With enough tires available to build over 800 installations we are thrilled to roll-out our innovative circular solution globally.

Question 1:

Black Bear needs to scale up rapidly in order to make a significant positive impact and is facing several obstacles in order to achieve this.

First, Black Bear like many circular start-ups operates in conservative markets and where an acceleration of the transition to a circular economy has to be made. At this moment less than 1% of all companies in Europe are circular, so a big transition is needed. This acceleration can be achieved by creating awareness and (financial) stimulation on national and European level. As an example, it took major efforts to put sustainable energy on the agenda and similar effort will be required for the circular economy.

Access to finance is one of the main hurdles that have to be overcome in order to grow. Although the investment cases are solid, institutions such as the European Investment Bank and other

traditional sources of capital are still hesitant and shy away from new technologies and new business models. Subsidies are available for sustainable initiatives, but most application processes are overcomplicated and have very little chance of success. Although we were eligible, funding from Horizon 2020 was unfortunately unavailable in the past - at the moment we are awaiting the verdict of our third attempt. EU funding at regional level has the advantage of a higher success rate, but can only cover a portion of the capital needed for successful scale-up. Bank guarantees could be a solution, however there is no clear structure at this moment, with as a result that banks are interested, but in a 'wait and see' mode.

A third obstacle that needs serious consideration is tax policy. At this moment, there is no effective carbon tax that pushes industries into really becoming cleaner and greener. As a result

Question 2:

Instruments such as Horizon 2020 give sustainable initiatives a chance to get financial support and gain advice on

Europe needs game changers in the circular economy. We as Black Bear are ready for international roll-out. We are proudly taking on the role of a successful example in the circular economy and hope we can inspire others to follow.



Poland

Name of the company:

Saule Technologies



SAULE
TECHNOLOGIES



About the company:

Saule Technologies (Saule Sp. z o.o.) was founded in June 2014 to develop and commercialize an industrial production method of ultra-thin, flexible solar cells based on perovskites. The founders of the company are Olga Malinkiewicz, Piotr Krych and Artur Kupczunas. In 2014 Saule Technologies received the title of „Start-up of 2014” from the Marshal of the Polish Parliament granted within BusinessLink organization.

Currently the company is working on methods of producing larger and more efficient cells, as well as developing a test production line.

Question 1:

Saule Technologies' is a startup company with a strategy to create a product ready for mass production – an ultra-thin solar cell based on perovskites. To speed up the commercialization process we are developing the product in our laboratory and at the same time talking with potential investors and partners who want to implement it in their devices or solutions.

The biggest obstacle during this process was to find an investor in Poland and abroad at such an early stage of development of the project. Saule Technologies has tried to interest the biggest companies and innovators, as well as many investment funds. We were able to reach an investor in Japan, who is a passionate of new technologies and after our meeting he decided to support us. This also helped Saule Technologies in receiving funds from the Polish government and to start our works on creating a world's first commercial use of perovskites.

Question 2:

The most important moment for the company was receiving European Union subvention from the National Centre for Research and Development and the financing from the Japanese investor. This allowed to start the research process on a bigger scale and to bring fast results - our team was the first to present a flexible perovskite demonstration device allowing to charge a smartphone with solar energy.

The financing allowed us to recruit international experts from the fields of engineering, chemistry and physics and build and equip our laboratory, which is now one of the most advanced optoelectronic laboratories in Europe. During our work we also cooperate with many European universities and companies. This allows us to be up to date with all the new solutions, but also to test our technology in various conditions.

Poland

Name of the company:

Synektik



About the company:

Synektik is a leading supplier of innovative products, services and IT solutions for diagnostic imaging and nuclear medicine. We are a manufacturer and distributor of radiopharmaceuticals for Positron Emission Tomography (PET), used in the diagnosis of cancer. We are developing also in the area of radiolabeled tracers for the diagnosis of cardiac and neurological diseases, which are the future of modern diagnostic imaging. We are providing technologically advanced equipment for diagnostic imaging. We are a manufacturer of software such as PACS, RIS and diagnostic stations for diagnostic imaging departments. Our innovative solutions are response for the current needs of the market by offering solutions for teleradiology and registration of surgery in the operating room with the possibility of remote assistance and follow-up live.

Question 1:

Synektik is a company with a strategy to develop a radiotracer for myocardial perfusion imaging with global potential. It should be mentioned, that the development of a radio-pharmaceutical product from discovery to phase III of clinical trials (to market) is very risky and cost-intensive. It is crucial to ensure funding continuity for the whole path of development of the product. Unfortunately, it is very difficult to find investors at the initial stage of product development. So, for companies in a similar situation, it is important to get support from funds with resources such as government or EU programs. The development of our radiotracer for myocardial perfusion imaging was made possible, among other requirements, thanks to the support of the H2020 program and national programs. To make the commercialization

process successful we are developing the radiotracer in our R&D facility and in parallel we are searching for potential investors and partners who are interested in leveraging our product.

Question 2:

Undoubtedly, very important for the development of our product was to receive the grant from the H2020 program. This allowed us to continue with clinical trials in humans, which are very crucial in the development of a pharmaceutical product, bearing in mind that they are the most expensive development stage. During clinical trial we are able to confirm the suitability of our radiotracer for the diagnosis of cardiac disease and register it upon successful completion as a pharmaceutical product in Poland, Europe and all over the world.

Portugal

Name of the company:

Veniam



About the company:

Veniam is building the Internet of Moving Things. Veniam turns vehicles into Wi-Fi hotspots and builds vehicular networks that expand wireless coverage and collect terabytes of actionable data. Veniam's game-changing solutions are composed by hardware, software and cloud components that deliver managed services to intelligent transportation systems in New York and Singapore, as well as in the world's largest network of connected vehicles, which includes taxis, waste collection trucks and the entire public bus fleet in Porto, Portugal, offering free Wi-Fi to more than 480,000 active customers. With offices in Silicon Valley, Porto (Portugal), and Singapore, Veniam is backed both by leading venture capital firms such as True Ventures, Union Square Ventures and Cane Investments, and by the corporate investment arms of Verizon, Cisco, Orange, Yamaha Motors and Liberty Global. Veniam was founded in 2012 in Portugal.

Question 1:

National policies involve unnecessary bureaucracy, particularly with respect to access to grants from European structural funds. It makes it hard for our public sector partners such as universities and municipalities to move at the speed we needed them to move, for example for smart city type of projects.

The way stock options are regulated in Europe makes it unnecessarily hard and less attractive to set up a stock option pool for employees that can help

them feel like the company belongs to them too. The participation of EU funding in venture capital firms brings an array of constraints such as excessive reporting and less flexibility of use of funds, which hinders the type of market experimentation start-ups and scale-ups need to do.

Question 2:

Strong investment in science and technology, training of highly qualified professionals and IT specialists.

Romania



Name of the company:

Nanopro Start M.C.

About the company:

SC Nanopro Start MC SRL is an innovative SME company with main headquarters in Pitesti, the capital and largest city of Argeş County, important commercial and industrial city, as well as the home of two universities.

The company was founded in 2008 starting with its knowledge of excellence in atomic force microscopy and electronics. Since 2013 it started to develop and produce the first atomic force microscope in Romania. This device was developed entirely with the technical knowledge from the company. The company develops products and services in 8 areas: NANO-AFM Systems, HV Amplifiers, GPS/GSM Systems, Motor Drivers, Laser Positioning Detection Systems, XYZ Positioning Systems, Digital Audio Amps and Electronics.

Question 1:

First is high bureaucracy in every interaction a company has with state authorities including long time spending in useless lines (ques), inappropriate forms, and poorly prepared professional in solving corporate issues. Second one is lack of understanding for funding start-up companies and initiatives. Very often conditions of funding are totally inappropriately related to immediate market performance, e.g., revenue, number of customers etc. National authority personnel does not understand that percentage of a successful business is somewhere around 2% of start-up companies.

Third difficult aspect is related to the ways of investing and financing new and established companies. At the EU level Venture Capital (VC) concept is

very little developed compared to USA. In Romanian case VC concept is even poorly understood. However, Romania has a huge opportunity for businesses due to the existence of Structural Funds, which is not fully exploited. Unfortunately, Structural Funds for businesses are very low percentage from the amount of total Structural Funds allocated to Romania.

Question 2:

At EU level, the amount and the percentage of funding for SMEs should be increased, based on the fact that VCs have very low profile in Europe and for many SMEs, EU funding represents their first capability in implementing a new idea. At the national level bureaucracy should be drastically decreased and procedures of funding should be simplified.

Slovakia

Name of the company:

AeroMobil



About the company:

AeroMobil is an advanced engineering company that is commercializing a sophisticated flying car, combining a luxury sports car and a light aircraft in a single vehicle. AeroMobil aims to make personal transportation vastly more efficient and environmentally friendly by helping to overcome traffic jams in large metropolitan areas and by allowing significantly faster door-to-door travel for medium distances or in areas with limited road infrastructure.

Question 1:

Europe has great science but lacks disruptive and fast-growing science- and R&D-based companies. Great amount of cutting-edge IP being generated and a lot of technology companies are being started in Europe but many of them fail before they build a product. Courage to risk taking in financing the deep technology innovation and hardware can be considered as much lower than in other parts of the world. This can prevent some of the companies to develop to the phase when they have ready to market product or service.

Question 2:

Single market and free movement of people help advance cooperation across the borders and scale-up the businesses. However, changes in overall EU landscape and different rules or standards in some European countries can have disadvantageous effects on scaling. We hope that the digital single market initiatives especially collaborative economy, standards and interoperability and intellectual property rights enforcement can make huge difference in developing the businesses in the future.



Spain

Name of the company:

Onyx Solar



About the company:

ONYX Solar is an engineering company created in 2009 that produce photovoltaic transparent glass. Our central office is located in Avila (Spain), together with our photovoltaic glass manufacturing plant (with a production capacity of 140,000 square meters /year). As the only architectural glass that pays for itself and thanks to its infinite customizable possibilities, it has been selected for more than 70 flagship projects in 25 countries by customers such as Samsung, Coca-Cola, Novartis, Foster, SOM or Vignoly and it has been awarded 30 prestigious international recognitions, including the "Best Global photovoltaic Glass Provider" at the Sustainable Building Awards 2016, run by the BUILD Magazine.

Question 1:

1) From the legislative point of view, VAT regulation has room for improvement. Any product or service you sell is subjected to value-added tax which depends on Member State levels. Recently, it has been agreed for all sales in Europe to apply the VAT rate at the point of sale – regardless of whether the product was sold over the Internet or not. For our company, this means that we must now work under the administrative complexity of reporting, paying and/or recovering VAT in different countries, with different rules, rates and laws and it is a burden every time we have a new client in a new market. Since it can be understood for the clients we have in Latin America or US, it is something discouraging within Europe and our theoretical Single market.

2) From the non-legislative point of view, establishing in foreign markets is expensive and not as quick as expected.

Operating in the internet area, with only one click, reaching millions of people is possible. In this sense, for Onyx Solar, online marketing and communication strategy has been one of the main growth approaches that the company has implemented since its foundation leading the company to be one of the best online positioned BIPV companies in the world. However, for our product this is not enough, and our corporate strategy based on International offices and a consolidated distribution network operating worldwide, defines the other key main growth pillars for optimizing the interaction with customers to highly increase the probability of success.

In this sense, one of the key steps for Onyx Solar was setting up a commercial office in USA as well as the establishment and consolidation of a distribution network covering the majority of rest main target markets. Onyx Solar efforts to this effect paid off and in 2012 one of the most important con-

tracts for the company was signed: The installation of the largest PV skylight in the world for Novartis Headquarters in New Jersey which after completion was awarded as the Best Sustainable Project in New York in 2014 by the prestigious ENR magazine. This example as well as other key projects and crucial steps have allowed Onyx's growth and international expansion, overcoming international market barriers and leading to its current clear leadership position within BIPV sector.

Our conclusion based on these elements is that in key markets, a physical presence is needed and this takes effort and resources and the current portfolio of access to finance options for that tends to be either insufficient in size or overburden in conditions for technology intensive SME.

Question 2:

Onyx Solar was founded in 2009, coinciding with the collapse of both construction and solar photovoltaic (PV) energy sectors. (39 MW of PV solar power installed in 2009 vs 2800 MW in 2008). Due to this scenario Onyx Solar was born with the aim of being a global company fully independent of national market tendencies or regulations. This mindset has helped us significantly to upscale and has a double positive effect: firstly, once the entrance in the most important international markets is accomplished, you gain the capability of easily getting adapted to market restrictions in other

countries. And secondly, your visibility for future international opportunities progressively increases and you have a more advantageous position by the time your national market start showing again a positive tendency.

In terms of technology, and considering the nature of our product, we have taken benefit from the public support for research and innovation. We have participated in several funded collaborative programmes starting from regional and national organisms (ADE, CDTI, MINECO) and progressively jumping up to EU level (LIFE, IEE, 7PM, H2020). This kind of projects, especially EU funded ones, are useful for companies like us to collaborate with prestigious R&D technological centers, leading academic and industrial partners in order to gain visibility, move forward quicker our technologies, develop new innovative solutions adapted to the market needs and/or to access potential lead clients.

In terms of business, we have benefitted from the H2020 SME instrument ph2. This project has supposed a significant milestone for Onyx Solar. Its unique features of single company-high grant intensity-business focus has indeed allowed us to accelerate our product development to reach the market, although it just represents the trigger that would need follow-up finance to ensure a wide reach in the market.

Spain

Name of the company:

GIGIGO

gigigo



About the company:

Gigigo is an ICT company aiming to become world leaders in transforming and developing businesses through mobility. Founded in 2004, Gigigo has become a solid and reliable digital partner, capable of taking and guiding big corporations along their path of digital transformation. The company has radically changed its core business in the last 6 years focusing on developing business solutions for inbound marketing through mobility and innovation.

Question 1:

1) Any product or service you sell is subjected to value-added tax which depends on Member State levels. Recently, it has been agreed for all sales in Europe to apply the VAT rate at the point of sale – regardless of whether the product was sold over the Internet or not. For our company, this means that we must now work under the administrative complexity of reporting, paying and/or recovering VAT in different countries, with different rules, rates and laws and it is a burden every time we have a new client in a new market. Since it can be understood for the clients we have in Latin America or US, it is something discouraging within Europe and our theoretical Single market.

2) Expanding in new markets in a structural way takes time and money, especially in terms of marketing effort. Although in many cases technological risk is solved, commercial risk is always present any time you are aiming to sell

your product. This bottleneck has two dimensions for us: On the one hand, the current portfolio of access to finance options for that tends to be either insufficient in size or overburden in conditions for technology intensive SME and, on the other, reaching a wide base of small customers is not a quick market-entry strategy despite being resources intensive.

Question 2:

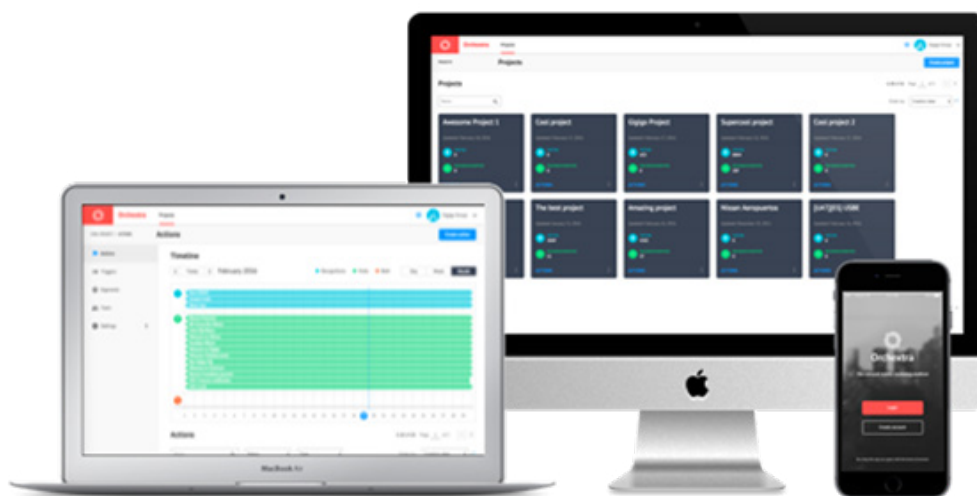
We were born with the ambition of being a global company. This long term vision helped us a lot to become international. In the internet area, location is no longer the problem but you still need to have face to face interaction with the customers, including a strong demonstration component, and for this, time and money is key.

From the research point of view, we have participated in several funded collaborative programmes (regional, national and EU level) where applied

research was the focus. This kind of projects is useful for companies like us to move forward quicker our technologies and/or to access potential lead clients.

From the business point of view, we have benefitted from the H2020 SME instrument ph2. Its unique features

of single company-high grant intensity-business focus has indeed allowed us to accelerate our product development to reach the market, although it just represents the trigger that would need follow-up finance to ensure a wide reach in the market.



United Kingdom

Name of the company:

Gordon Murray Design



About the company:

Gordon Murray Design has grown from 8 employees when it was set up in 2008 to 130 today. Once licensing agreements kick in, it expects revenues to increase significantly and for staff numbers to expand dramatically.

Gordon Murray Design has built a Global reputation as one of the 'finest automotive design teams in the World' and was established in 2007 to develop an innovative and disruptive manufacturing technology trademarked iStream®.

Question 1:

national R&D grants have helped them go beyond engineering work, and they have appreciated the boost in credibility that comes from working in a consortium project that has government support



United Kingdom

CeresPower



Name of the company:

Ceres Power

About the company:

Ceres Power, based in Horsham, West Sussex, started as a small spin-out from Imperial College 15 years ago and now employs around 100 people. It has won support from Innovate UK for a number of projects to develop its technology over the last 10 years

Question 1:

national R&D grant that showed their technology could be mass manufactured



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Colophon

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