START UP
INDUSTRIAL
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Startup Guide

for Scientific Service Companies

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Contents

Anna Stenstam, CEO, CR Competence, Sweden (photo: CR Competence)

Insights for launching a successful new company

This guide has been written to help future founders of Scientific Service Companies (SSCs). These types of companies are very niche and have particular needs. Therefore, this is a tailored guide that will help you on your way to becoming the next Scientific Service Company in Europe. In this guide you will learn about 1) different kinds of business models, 2) the market you will operate within, 3) how to take your service to market and sell it, 4) future ideas about intellectual property, and 5) how you will fund your start-up in those early days.

SSCs are for-profit companies that give targeted support and advice to companies that need research and measurement services in evolving fields, such as new materials, nanotechnology, and life sciences. A detailed description of the SSC landscape and markets in Europe is presented in the SSC Market analysis report (Grönlund et al. 2020).

Dos

- Gather knowledge and expertise
- Know your customers and their needs
- Build trust and long-lasting relationships with your customers
- Have several different types of revenue source
- Hire engaged and skilled personnel
- Stay open minded, focused and re-adjust
- Be prepared for unexpected events
- Be prepared to receive help

Don’ts

- Do not promise what you cannot provide
- Do not under-price yourself
- Do not do things for free
- Listen to the customer and come back with a solution
- Do not ignore advice from others

Table 1. Insights from the CEOs of scientific service companies: dos and don’ts.

Fabia Gozzo, CEO and founder of Excelsus Structural Solutions (photo: CH Media/Alex Spichale)

Consider your business model

Selection of type of firm, partners and ownership shares

Choosing the right company form is one of the most important decisions when starting a business. Factors that influence the decision are, for example, scope of business, number of founders, initial capital requirements, risks, taxation and expansion plans.
The company forms vary somewhat depending on the country. Company forms for example in Finland are[1]:

- Proprietorship
- Limited company
- Partnership
- Limited partnership
- Cooperative association

Proprietorship represents the easiest and most common way to start business. In this company form, the entrepreneur is responsible for the firm and its decision-making, and they can also employ other people. (infoFinland.fi 2021)
A public limited company is often set up when capital is required for the operation. A limited company can own the property itself and can also raise capital for the future. A limited company is often selected as the company form when there are several founders. The advantage of a limited company is that it is possible to make decisions by the majority principle. In addition, financial risks in a limited company are more limited than, for example, a private trader/sole proprietor. Shareholders are liable for the company's commitments only with the amount of capital they have invested if they have not guaranteed personally to secure loans. Activities however, when starting to obtain external financing, the entrepreneur's personal guarantees and sureties are often also required.

Partnership implies that two or more people agree to sign a partnership, with an equal status in the operations, and personal responsibility of the decisions, debts and liabilities of the company. Limited partnership is similar to partnership, with the exception that there is at least one "sleeping" partner (normally acting as an investor) in addition to the one or more accountable partners. (infoFinland.fi 2021)

[1] For other countries, see for example list of legal entity types by country https://en.wikipedia.org/wiki/List_of_legal_entity_types_by_country

Cooperative association is a company, which is owned by its members, of which there can be one or many. The members are liable for the company's obligations to the extent of their investment of share capital. In the cooperative association's meetings, each member has one vote. (infoFinland.fi 2021)

Service productization

This section will describe the process of developing your special knowhow into a sellable, marketable and deliverable service product. The section is based on the book *Tuotteistaminen* (Eng. 'Productization') (2014) by Jari Parantainen.

The productization process from non-productised to fully productised can include these recognisable milestones (Parantainen 2014):

1. The expert (entrepreneur) starts to multiply at least some of the practices that they have recognised as good ways to do things. Those are repeated in similar form in different projects.

2. The service gets a name, which is used at least internally, and the price of the service begins to take shape, even though it still tends to vary based on tailored offerings.

3. The content of the service is becoming rather constant, which makes it possible to at least in principle put a fixed price on it.

4. It becomes possible for the expert (entrepreneur) to train their colleagues to deliver the service in a manner similar to how they would deliver it themselves. In terms of productization, this is a key stage enabling the service to be multiplied.

5. In this stage, it is required from the expert (entrepreneur) to make an informed decision to productise their service. For this, they must document the stages of the provision of the service (work instructions, check lists, document templates, training materials). Dividing the service into modules makes it practical to create tailored service offerings for different clients (mass customisation). The documentation enables the service to be reproduced even outside the original service-producing company.

6. Finally, the service is no longer intended to be produced by the original company itself. Rather, it can be licensed and distributed via a partner network, also abroad if language versions have been developed. The original developer of the service keeps improving the service concept. The original developer focuses in its business on productization, licensing and marketing. Taking it even further, it would involve the deployment of the franchising model: the service would be complemented with a tried and tested business model.

The development described above also makes marketing and sales activities gradually easier.

Through productization, your service can be multiplied without having to educate each new expert personally. In practice, this may take place with the help of e.g. manuals, checklists, templates, process descriptions, information systems, and training.

CEO tip

'The academia customer segment is easier to approach, generally motivated by publications, they may have access to dedicated budgets via grant application. You just need to motivate them to include your services when applying for grants. We spent the first year building trust and getting the service offering right. We wanted to build a portfolio of contacts.'

Bernhard Hesse, CEO, Xploraytion, Germany

CEO tip

'We began with a key pilot customer - one of the biggest research centres in Europe - by taking advantage of the contacts we already had. We worked hard on these contracts to make a good impression and through this were exposed to other companies and contacts.'

Sotiris Kokkinos, CEO, FEAC Engineering, Greece

Productization improves your service in four main ways (Parantainen 2014):

1. It becomes easier to buy through
   a. Standing apart from your competitors
   b. Bundling into service suites
   c. Removing sense of risk

2. It becomes stronger in terms of features through
   a. Creating your own monopoly
   b. Making an "obscene" promise
   c. Composing a fascinating story

3. It becomes more efficiently sellable and marketable through
   a. Encapsulating into marketable
   b. Pricing profitably
   c. Tailoring without tailoring

4. It can be multiplied more easily through
   a. Developing in a lean manner
   b. Multiplying service like a product
   c. Leading with the help of a format

If you consider your service needing to be tailored every time, that does not rule out the benefits of productising it. You can productise "modules", the combination of a suite of which can enable you to tailor your offering. A tailored offering can be built out of service components that remain the same for various clients.

Revenue generation model

A firm can get by by selling its services on a one-off basis. However, it would many times be preferable to strive to establish longer-term relationships with your customers. The process of finding new customers is more expensive than making repeated sales to your existing customers. By getting to know the needs of your customers better than your competitors, you will have a competitive advantage over them. If also your customer is new to the market and cannot compensate much for your services financially, it might be an alternative worth considering partnering with them on a more strategic level, and possibly entering a revenue sharing (or royalty) agreement with them. That way, you could offer e.g.

testing services to them on a regular basis, and in return you would receive a percentage on the sales of your customer's product.

It might also be a viable alternative to partner with another company with a service complementary to yours in order to deliver a service together. Networking activities help you to find possible new partners, with whom you can synergise and reach new business opportunities. Recently, a new network of Scientific Service Companies in Europe (including the UK) has been formed. For more information about the network, we advise you to visit mixn.org.

Rajala (2011) proposes strategies to decide before service launch:

A) Price differentiation

- Differentiate your product; add value to distinguish from competition
- Personalised pricing to each client
- Versioning; offer different varieties, let clients choose
- Group pricing; based on group membership/identity

B) Cost leadership

- Economies of scale (with multiple clients)
- Economies of scope (with selected customers)

With regard to service pricing, the basic determinant of the pricing of your service could be based on a) the value of your service to your clients, or b) the price where you maximise the result of contribution margin (price - variable costs) x units sold (=contribution margin-based pricing [De: Deckungsbeitrag]), c) based on the given pricing on the competitive market (=market-based pricing), or d) the price elasticity (Rajala 2011) of the demand of your service. Price elasticity means how the quantity of the demand of your service changes when the unit price is changed. If the demand of your service is inelastic (i.e. it has an elasticity less than 1), you could in principle raise the price to increase revenue (so-called "price effect" outweighs "quantity effect", meaning that your revenue increases relatively more than how much the quantity of sales is reduced due to the increase in price), if the demand is elastic (i.e. it has an elasticity higher than 1), you could lower the price to increase revenue (quantity effect outweighs price effect, meaning that the greater revenue due to greater demand outweighs the loss due to the reduction in price). Where a change in price results in a similar relative change in demand marks the point between elastic and inelastic demand, meaning that demand is then *unit elastic* (i.e. elasticity is 1). At that point, the price and quantity are optimal in terms of revenue, since at other points revenue could be increased by either lowering or increasing the price. (Hutchinson 2017)

Your company's revenue generation model might also be based on a loss-leader pricing. It implies that you would sell some part of your service proposition for less than its value in order to support the sales of another part of your service offering, or it can be deployed in order to gain more customer base for revenue that comes later. (Rajala 2003) This necessitates a careful definition of which are your company's profit makers and which are loss-leader offerings.

Having a fixed or in some other way a very clear price for your service will make it easier to communicate and market it, and also easier for the customer to buy it. A service that has a fixed price does not necessarily have to be profitable each time when you sell it, if some other clients are in turn relatively more profitable, and if your service having a fixed price makes it more easily purchasable in comparison with your competitors. When setting the price, if it seems difficult to define e.g. the amount of time it takes to deliver the service, it would imply that you have not defined the format and content of the service to a sufficient extent. (Parantainen 2014)

Prestige pricing implies that charging a higher price for your service may cause potential customers to perceive your service offering to be of higher quality. This model of pricing becomes more viable when your service does not have direct competition, or is clearly differentiated from substituting solutions. A downside of this pricing strategy is increased marketing spending, as customers are less likely to purchase a service they have not heard about, especially if it is priced higher.

CEO tip

'Always start with costs (be precise), add in contingency, put yourself in the shoes of the customer (what should the experience of your customer look like). With the Business Model Canvas (BMC) – put a price tag on every part.'

Simon Jacques, Managing Director, Finden Ltd, UK

Understand your market and what is the problem you are trying to solve

Market analysis

Before going to the market with your business, it would be highly recommendable to get to know the market thoroughly. For instance, the founder of the fast-growing Finnish underwear brand 'The Other Danish Guy' Tommi Lähde names knowing the market numbers as one of the three key factors to growing your firm (Arola 2018).

In order to analyse the target market, you can utilise for example the PESTLE analysis (e.g.[2]). It is a tool for analysing the external market environment from the point of view of six external influences: political, economic, sociological, technological, legal, and environmental.

- **Political:** influences such as regulations, restrictions, tax policies, political stability
- **Economic:** growth, employment, interest, inflation, credit availability
- **Sociological:** population structure, safety, health, culture
- **Technological:** technological development, adoption
- **Legal:** legislation, legal requirements, changes to legislation, quotas, imports, exports
- **Environmental:** climate change, sustainability, recyclability, environmental emergencies

You can compare your product with that of your competitors by conducting a SWOT analysis of them. SWOT analysis is a strategic planning technique used for identifying strengths, weaknesses, opportunities, and threats related to business competition. It is designed for use in the preliminary stages of decision-making processes and can be used as a tool for the evaluation of the strategic position of an organization. The SWOT analysis strives to uncover both internal and external factors influencing a company's performance and goals.
The analysis may concern either the company as a whole or, in more detail, some part of the business. At its best, SWOT analysis is a simple method that can be used at a company or industry level.

[2] https://www.cipd.co.uk/knowledge/strategy/organisational-development/pestle-analysis-factsheet

photo: Solid-Chem GmbH/Erik Schwarzer, Grubenglück

One of the key principles of conducting a useful analysis is that it should be as simple and practice-oriented as possible. The SWOT analysis groups key pieces of information into two main categories:

1) **Internal factors:** the strengths and weaknesses internal to the organization or the industry. These factors represent the current state of affairs.

2) **External factors:** the opportunities and threats presented by the environment external to the organization. These factors will potentially affect the success of the business in the future.

Once the aforementioned issues have been identified, they will be used as a basis for defining concrete operational courses of action. On a general level, one should strengthen the current strengths and continue to leverage them. Any weaknesses found should be corrected. Not all vulnerabilities can be eliminated, but efforts should be made to mitigate their effects. One should take advantage of opportunities within the boundaries of resources available, and prepare for threats with good planning so that things do not come as a surprise.

The SWOT analysis for Scientific Service Companies reflects in many ways characteristics that are similar to the business activity of other types of expert services. Table 2 presents the SWOT analysis that we have generated for a Scientific Service Company. Demand-related uncertainties represent some of the most central challenges of Scientific Service Companies (SSCs). SSCs are not yet well-known among potential customers. In addition, potential customer organisations may operate similar functions in-house, or their strategies or procedures do not support the outsourcing of such services. Therefore, it would be a recommendable course of action for SSCs to strive to increase general awareness about them on the market by increasing their focus on marketing and networking activities.

CEO tip

'With regards to the competition it all depends on what service you provide. We are providing unique services. Therefore, our competition is limited. There is always a tension between the customer and you regarding price. One way to work out the competition is to google research. You need to be having discussions with customers, sound out what they are doing and why they want to do it.'

Andy Beale, Chief Scientific Officer, Finden Ltd, UK

INTERNAL	**Strengths** High level of competence Stable financial situation through service sales Relevant product and service offerings Agility of the companies Own network of customers and research infrastructures	**Weaknesses** Low visibility Lack of business expertise Lack of private funding Dependence on public funding Difficult to attract skilled workforce
EXTERNAL	**Opportunities** Growing demand for expertise in materials science Growth potential in intermediary R&D services Industry-wide business networks bringing awareness New sources for financial support	**Threats** Company strategies not aligned with purchasing of SSC services Competitive situation becoming tougher Accessing financing and support mechanisms to enable faster growth can become increasingly challenging for companies Uncertainty in trends of technical development Low availability of skilled workforce

Table 2. A summary of the results of the SWOT analysis of the scientific services business (Grönlund et al. 2020)

The competition within the industry is an essential factor affecting the firm's marketing. The competition, attractiveness, profitability of, and industry is often analysed with Porter's five competition forces model. With its competition strategy the firm needs to find a position, where it can best benefit from, influence, or defend itself against them. Competitive advantage is a firm's comparative advantage in some aspect of successful business. I.e. superior quality or lower price. In order to analyse the competitive situation of the target market, you can utilise Porter's Five forces analysis (see Figure 1).

CEO tip

'Hardest competitors are the institutes, they have the industry support and finance support. Value based pricing – this is about convincing the customer of the true value of the service. Measurements, data analysis, problem solving, investigation research but business value gains the biggest price.'

Mårten Edwards, CEO, Uppsala Synchrotronix AB, Sweden

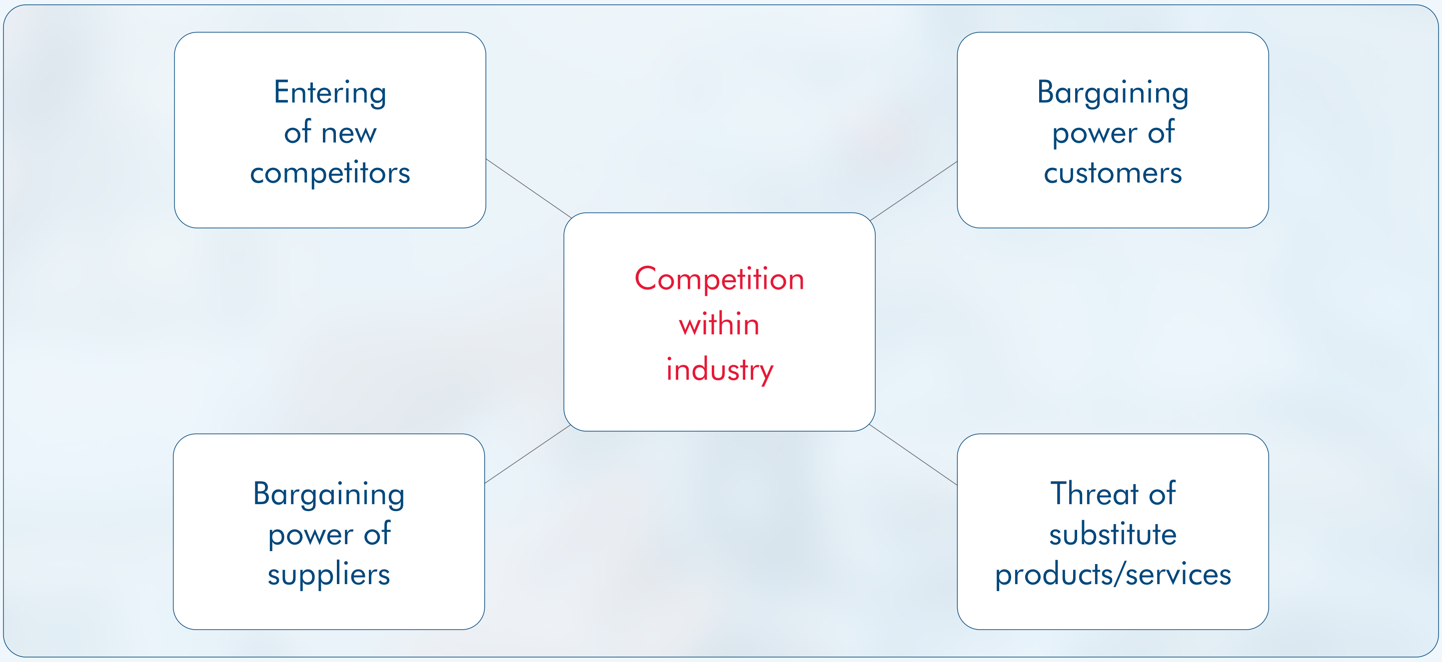


Figure 1. A Graphical presentation of Porter's five forces analysis (Porter 1979)

How will you find customers and speak with them?

What is key to note when looking at contacting customers, marketing and the sales process is that Scientific Service Companies are selling trust. There is no tangible product as the company is selling analytical services, experiments or consultancy. In order to generate sales and build contacts to convince customers of the value add of the expertise your company can bring and the solution orientated approach to their problems. The first step is to build your profile as an expert in the area, gain experience and contacts through the first contracts. For all successful Scientific Service Companies it was the first contracts made that laid the foundation for future growth. In many cases this was a deepening of relationships within one organisation across multiple departments.

CEO tip

'It takes half my time to get new clients, and about a year from contact to project. It is crucial to consider thoroughly who you are selling to. For example, individuals representing a business unit or a corporate function are interested in different deliverables. You cannot sell to all in the same way. As a Scientific Service Company you are selling trust, and that is the only thing that is truly generic.'

Anna Stenstam, CEO, CR Competence, Sweden

Marketing

Marketing is a crucial process for generating the demand necessary to sustain your business as a Scientific Service Company. Already before founding a company it is necessary to find an answer to three questions fundamental for marketing: Who are my customers? Where can they be found? Why would they purchase from my company instead of my competitors? A new entrepreneur needs also to pay special attention to allocate enough money for marketing when budgeting and applying for financing. Furthermore, already from the start, it is worthwhile to start building your own customer register (taking into account EU GDPRs). Consider also registering with Google My Business, or similar. (Federation of Finnish Enterprises 2018) The following list sums up 10 key factors to take into consideration with regard to your marketing strategy, based on Frederiksen (2021).

1. **Research**
   In order to be able to make informed decisions about your marketing, it is of utmost importance to conduct research about the market (clients, prospects, competition). It helps you to develop an objective baseline about the market, how you are performing, and where your business should be going.

2. **Niche-driven strategy**
   Your specialisation and niche focus on a business area that you know thoroughly. This makes it possible for you to differentiate your company from other industry players, and makes it possible for your company to grow fast and become a well-recognised leader in that particular niche. Your specialisation defines your business activities and enables for a clear distinguishable marketing strategy based on it.

3. **High-performance website**
   Your company's website will act as a projection of its expertise into the market. Most of your clients are likely to have a look at your website when assessing which service provider to choose. Topical content (e.g. educating your clients, communicating the benefits of your solution) on your website can contribute to driving leads to increasingly close engagements with you, leading to new business (through a threefold process: attracting prospects -> building engagement -> turning opportunities into clients).

4. **Search engine optimisation**
   Search engine optimisation is crucial for facilitating your potential customers to find your website. It can be divided into two: on, and off-site optimisation. On-site search engine optimisation implies keyword phrases that are based on the particular expertise and services of your company. Off-site search engine optimisation means links on the Internet that point to your company's website. The popularity and relevance of the websites linking to your website contribute to a higher search engine ranking of your company's website in search results.

5. **Social media**
   Social media is an actively used channel for potential customers to find information about service providers. Furthermore, it enables you to establish connections with relevant people, and it is a channel for you to monitor your brand.

6. **Advertising**
   As a provider of business-to-business services, you would use types of advertising best suited for professional services. Examples of advertising platforms include: industry publications and websites; social media; search engine marketing; retargeting (following your audience with the help of cookies and offering relevant advertisements). It is desirable to aim to target directly appropriate industries, to which focused means such as LinkedIn and retargeting are good.

7. **Referral marketing**
   Existing clients are naturally an important source for referrals, but by building your brand recognition and a good reputation for your specific expertise, you can get referrals also from non-clients. Content marketing is a way to reinforce your reputation, in addition to the other tactics described here. (Content marketing means creating and providing valuable and relevant content to your potential customers [in contrast to merely pitching your services]. It can take the form of e. g. educational articles and webinars.)

8. **Marketing automation, CRM, and lead nurturing**
   Marketing automation is a centralised tool for managing and measuring your online marketing.
   CRM (customer relationship management system) enables you to stay organised with your opportunities, clients and interactions with them. It is crucial to keep track of your history with specific leads and customers, and CRM helps you to do it in a systematic manner. This way, you can check how you have interacted with them earlier, and also helps to organise your after-marketing interactions. CRM will contribute to your repeated business.
   Lead nurturing means taking care of the leads (connections to potential customers) that you have generated. It can be done through your website and email for exaple by targeted analytics-based campaigns of delivering tailored offers and successive relevant content, with an aim to gradually build a closer engagement with your potential customers.

9. **Testing and optimisation**
   Testing and optimisation implies the continuing process of evaluating, testing and adjusting your marketing efforts in an iterative manner. For instance, you can use A/B testing tools to find out which emails and/or webpages result in more customers, based on their varying properties of e. g. language and design. Furthermore, there are tools to help you to test how your emails are displayed on different platforms and devices, in order to ensure that they are displayed in the way you intended.

10. **Analytics and reporting**
    Analytics tools help you to get an understanding of which of your marketing measures are working and which are not. For the analysis of website traffic, Google Analytics is a useful tool. In addition, there are other tools that help you to monitor your search advertising success, and efforts in social media. (Frederiksen 2021)

There are many innovative ways to build client relationships through knowledge transfer and being the go-to company for specialist expertise on topics. This could be through thought leadership sessions at conferences, virtual workshops and networking. It could also be through providing bespoke in-house seminars, training sessions to upskill companies on future ways of working. This has a multiplier effect within companies, cross departments and within networks.

CEO tip

Building client relationships through 'Lunch & Learns'
'Be generous with your time, CR provides for example "Lunch and Learns", white papers and updates. Also training seminars for clients in-house to update their staff on technological developments relevant for their industry. In this way, you add value to your customers at the same time as you get to know each other.'
Anna Stenstam, CEO, CR Competence, Sweden

photo: Solid-Chem GmbH/Erik Schwarzer, Grubenglück

Managing intellectual property rights

In this section, we present shortly the basic concepts related to intellectual property rights (IPR), which start-up entrepreneurs should be aware of. Intellectual property rights include copyright, patent rights, rights in a trademark, utility model rights, design copyright, rights to a commercial name, protection of integrated circuits and layout designs etc. An important distinction between copyright and so-called industrial rights is that the latter require registration, whereas copyright does not.

The intellectual property rights represent a part of the intangible assets of an organisation.

- Intangible assets
  - The non-financial, non-physical resources used by an organization
  - Basically, anything in intangible form that creates value for the organization

- Intellectual Property Rights
  - Exclusive right defined in the laws (Legal concepts)
  - Character and limitation in the laws
  - The ways to obtain are defined in the laws
  - IPRs are part of intangible assets

IPR strategy

According to the Swedish Intellectual Property Office PRV (2021) an IPR strategy is a strategy for managing a company's intellectual property rights portfolio and its purpose is to help the entrepreneur to manage these intangible assets in a professional manner, in order to maximise the commercial benefits. A good IPR strategy should include both an analysis of competitors and an analysis of risks, and consider the company's long-term commercial objectives. An intellectual property rights strategy can also include a plan which sets out the extent to which and the way in which the company is prepared to defend its intellectual property rights in the event of infringement, e.g. pirate copying of one of the company's products or the unlawful use of copyright-protected material[3] (Swedish Intellectual Property Office PRV, 2021).

[3] Swedish Intellectual Property Office PRV provides a test to find out what intangible assets you company might have https://www.prv.se/en/entrepreneurs/test-your-business/

Here is a summary of key IPR-related questions (Sinervo, 2021 and Swedish Intellectual Property Office PRV, 2021) and that you are advised to consider for your benefit in your business activity and strategy:

1. What innovations can we apply a patent for?
2. How can we commercialise them and make money?
3. Should we apply for design protection for any of our products?
4. Methodical search and monitoring of IPR of competitors (possibly of customers and suppliers): establish a sustaining process where you continue to keep track of the IPR of the actors in your business environment.
5. Consideration of (employees) inventor's/creator's rights: establish a formal policy of how the IP created by your staff are respected and utilised in your business.
6. Effective Non-disclosure: ensure that the security of the IP of your business be maintained at all times, and require stakeholders to enter non-disclosure agreements (NDA) before being granted access to any non-public IP of the company.
7. Documented publication: when the copyright protected subject matter is created it should be documented and possibly released with date in some way. Then no one can later claim that they have created it.
8. Budgets/costs - control and focus: establish IP protection in markets that have current and possible future significance for your business. What markets do we need to protect: homeland, European Union or global?
9. What protection does our trademark/business name need? Protect your brand by registering it. When deciding on your business name, consider the feasibility to protect it through registration. You may want to register different spelling forms of your business name in order to avoid competitors registering them.
10. Define focusses: identify the current and expected cash generators, drop the non-promising early
11. File before publish: do not publish potentially patentable inventions before the patent application is filed. Published inventions cannot be patented.
12. How do we defend our copyrights? Identify infringements and react early. Do not let the infringers continue illegal use.
13. Do we have patents, which can be licensed out or sold? What to do with unused IPRs: Sell, license or allow to lapse.
14. Are there any patents that we should purchase?

The core team of CR Competence AB
(photo: CR Competence)

Learn the basics of operating your business

Financial management

In order to understand how a company works entrepreneurs have to understand the output they receive from an accountant or other financial professional. It is not necessary to know as many details as the accounting professionals, but an entrepreneur must have a sufficient picture of the financial status of the company. In order to do so they have to understand financial statements to make important business decisions and in communicating with different stakeholder groups. Therefore, the function of external accounting is to produce calculations for the stakeholders of a company or other entity, such as owners, investors, tax administration and other authorities, partners, customers and suppliers, employees, media and general public.[4]

The company's operations consist of several processes, i.e. chains of operations. The purpose of supply chains is to produce products or services for the customer. These processes are called business processes. Business processes vary somewhat depending on the company's industry and business idea. In addition to these, two separate processes can be distinguished in the company's accounting, the real and the monetary process. The real process describes the transfer of raw materials, services and other goods procured by a company through the production process from suppliers of goods or services to customers.

The money process, in turn, describes the transfer of money as a payment for the output of the real process. Customers make a payment for the goods they purchase to a company, which in turn pays the goods and services they purchase to the suppliers of the goods or services. The money process thus runs in the process diagram in the opposite direction to the real process.

According to the definition provided by The American Accounting Association accounting is "The process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information". In other words, accounting is systematic and

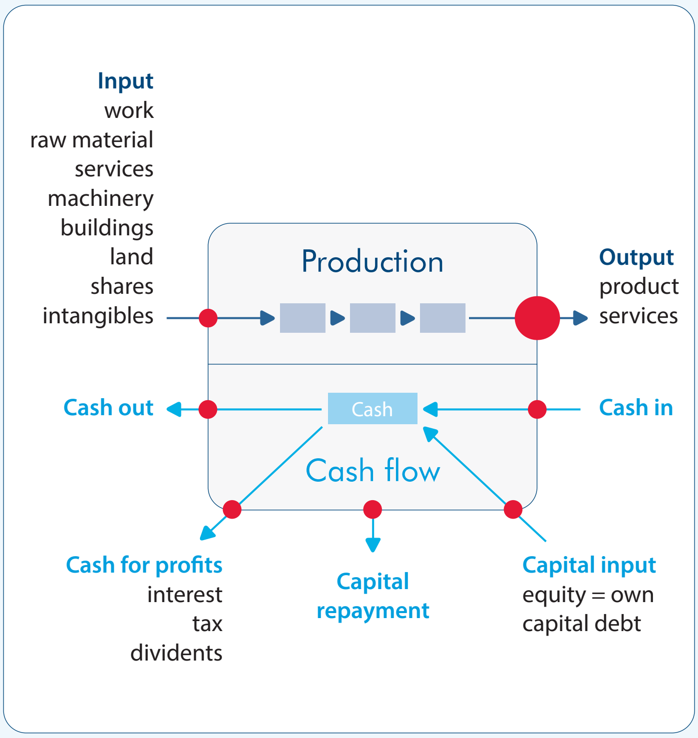


Figure 3. The business process: real and monetary process

comprehensive recording of financial transactions pertaining to a business. Accounting also refers to the process of summarizing, analysing and reporting these transactions. The reports generated by streams of accounting are invaluable in helping management make informed decisions.

Accounting is usually divided to three broad branches:

- Financial accounting = external accounting
- Management accounting = internal accounting
- Financial management

Tasks of accounting

- Maintaining **trust** between the firm and the owners (plus other stakeholders) **Financial accounting** = the preparation of financial statements, summarizing past events, usually in the form of profit and loss accounts and balance sheets

[4] Additional reading concerning basics of accounting see for example Accounting for Non - Accountants : a Manual for Managers and Students, 7th ed. Mott, Graham London: Kogan Page Ltd., 2008

- Keeping the company together / supporting the decision-making / empowering **Management accounting** = provision of much more detailed information about current and future planned events to allow management to carry out their roles of planning, control and decision-making.
- Maintaining liquidity, managing Working Capital, balancing financial structure, financial markets.
  Financial management = covers the raising of finance and its deployment in the various resources needed by a business, in the most efficient way.
- Routines (bookkeeping, payments, reports etc.).

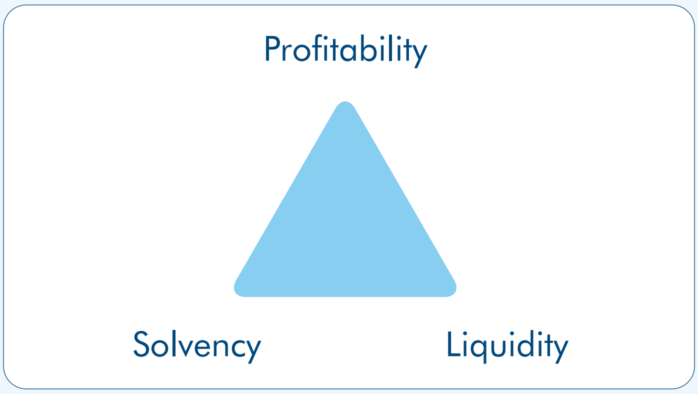


Figure 4. Company's health triangle,
(Modified illustration of Laitinen & Luotonen, 1996)

A company's health triangle (see Figure 4) helps to understand the factors that are important to a company's operations and future, which are profitability, solvency and liquidity. Profitability is a matter of generating more revenue than expenditure for a company and it is the lifeblood of every business. Entrepreneurs should understand the formation of their own gross margin and actively monitor it. Solvency is a measure of a company's ability to tolerate losses and meet its long-term commitments. Liquidity means a company's readiness to cope with its payments in the short term.

A budget is a monetary action plan for a company's future operations and an estimate of revenue, expenditure, and financial performance for the coming months or years. On the other hand, it also refers to the preparation of the budget. The budget period is the future period for which the budget is established and the most common budget period is calendar year or accounting period, which can be divided into shorter observation periods. The purpose of budgets is to help the company's management in the planning of activities, monitoring of activities and coordinating the various activities of the company (see Figure 5).

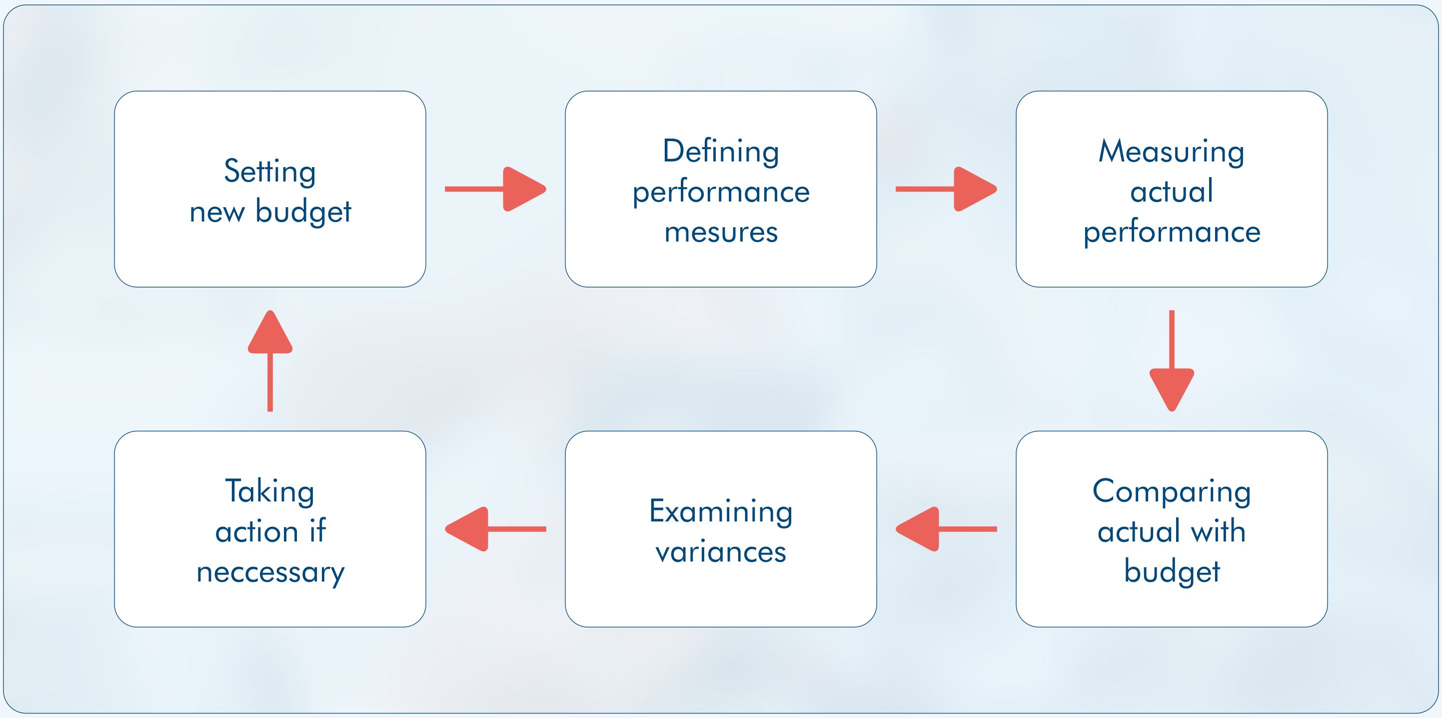
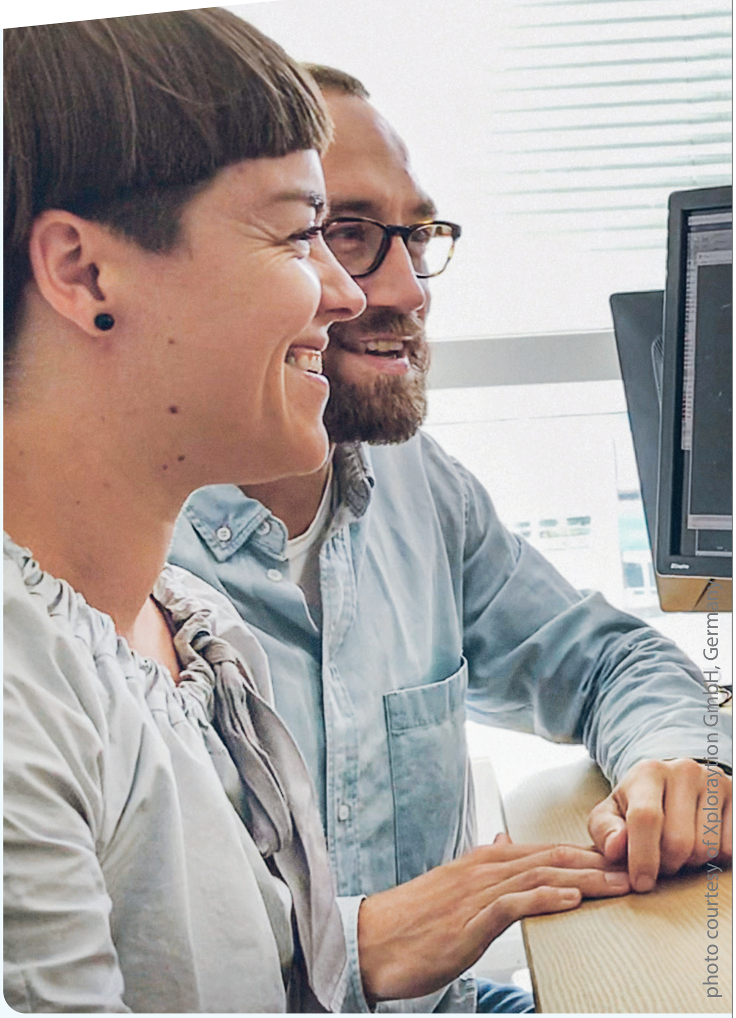


Figure 5. Budgetary control cycle

Consider how you will start and fund your business



Arguably the most stressful part of starting a new business is working out how to fund it and how much you need to survive. However, for SSCs it does not always have to start with a large investment to get going. There are many ways of being lean and being able to stretch funding over a longer period. It is about finding the right ways for the SSC and the founders. Particularly, with the slower growth of SSCs it is likely that scientific entrepreneurs, or "sciencepreneurs", will keep on an additional income whilst starting the business. However, it is good to plan the additional financial support required and be aware of the options or deadlines that might be ahead so that opportunities are not missed, e. g. external investment in the shape of loans, grants or giving away equity.

There are many types of financial support for start-up companies, particularly SMEs across Europe. Particularly from national public funds, regional public, EU structural funds and private funds. Everyone talks about venture capital money. However, most companies actually do not go down that route, and a lot of successful companies have never needed it. For deep tech[5] products that are scalable and with a high growth potential the work required to prepare for a VC (venture capital) pitch is necessary. It can also be complemented with obtaining grants to increase the available cash within the business to help the speed of growth. However, for SSCs the business model is centred primarily around a service and therefore has limited scalability at the start, unless software is developed in the future.

The European Commission gives a focus on small and medium-sized enterprises of which the SSCs can benefit from:
Europe's 25 million small and medium-sized enterprises (SMEs) are our focus. They represent over 99% of businesses in the EU. They employ two out of every three employees, create 85% of all new jobs and generate about three-fifth of the EU value-added. Tailor-made support to help them grow and innovate is essential. At all stages of development, small businesses struggle more than large enterprises to get finance. To stay competitive, both start-ups and scale-ups rely on external finance for innovation, digitalisation, internationalisation and upskilling.[6]

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[5] 'Deep Tech' means technology based on tangible engineering innovation or scientific advances and discoveries. Deep Tech is often set apart by its profound enabling power, the differentiation it can create, and its potential to catalyse change. Deep Tech companies often possess fundamental and defensible engineering innovations that distinguish them from those companies focused on the incremental refinement or delivery of standardised technologies, or those that only use business model innovation to create opportunities. Deep Tech spans many technological areas and can impact diverse applications. (https://www.techworks.org.uk/about/what-is-deep-tech)
[6] European Commission (ec.europa.eu/growth/access-to-finanance_en_)

This chapter will help you navigate the most relevant sources of funding for scientific service companies but also indicate other sources that could help in the future as you grow. Whether you are starting from scratch or spinning out from a university the following sources could be applicable.

We will start with the first stage of funding which is called Seed Capital. It is the earliest stage of investment. Sources include personal savings, friends and family, crowdfunding and personal sales. Many SSCs have started in this manner, by utilising their own personal savings.

Personal savings

The strengths of utilising personal savings:

- As a founder, you keep 100% control of your company and can grow at your own pace, without the pressure of other parties.
- You can focus on growing the business, acquiring new customers rather than financing and funding rounds and pitches. All of which take time and cause high stress.
- You keep full ownership and do not release any equity to external parties.

The downsides of utilising personal savings:

- There's risk, if the business does not work out then you are responsible.
- You may need to run a second job (e.g. remain in academia) whilst the company grows and becomes profitable. Typically, for SSCs there is a slow growth. You will need money to keep your living expenses and family costs.
- You are the main generator of sales, creating networks and making connections with the right people.

Family and friends

This is a typical source of funding for SSCs and is basically taking a loan from your family and / or friends.

The strengths of utilising family and friends' funds:

- Your family and friends' network will have a greater understanding of what you are trying to achieve and therefore, in theory it should be easier to secure funds.
- There could be a lower rate of interest applied to the loan that you would take via this source and the repayment terms may be more flexible.
- The gratification of achieving success would be shared amongst your closest network circle.

The downsides of utilising family and friends' funds:

- If things do not go smoothly then relationships could be affected.
- The funding amount will be limited unless you have extremely wealthy friends and family.
- With external investors you may receive more business knowledge transfer or connections, even potential introductions to new customers. With family and friends' funding this may not be the case.

Loans and other debt financing options

In short this is taking a loan from a bank (or external source) that will have to be paid back in the future with a certain term of interest. This is a more flexible route of lending and can be cheaper in comparison to equity funding with less risk.

The strengths of utilising loans:

- As a founder you will keep 100% control of your company and can decide on the day to day running and future strategy of where you want this to go.
- Upon paying back the loan your liability is over.
- There are tax benefits of having a loan, this is worth exploring with your tax advisor.
- Once you are making revenue the possibilities with the bank could improve.

The downsides of utilising loans:

- Most bank loans are secured and therefore you will need some form of collateral e.g. equipment, home and so forth.
- Terms of repayment need to be met and therefore could put your assets at risk e.g. home.
- Interest rates linked to bank loans can be high and can fluctuate over time unless you have decided upon a fixed rate of interest.
- Having loans can affect the value of your business if one day you do decide to sell.

CEO tip

'You need a bank, they should be your partner. They will help you with the financial blocks. Keep in good contact with your bank and let them know your journey and what is happening.'

Simon Jacques, Managing Director, Finden Ltd, UK

Governmental grants and EU funding

The CEOs of European SSCs emphasise the role of grant funding as an important source of revenue when you are building your business.

> Grant funding has helped us grow. Trying to grow the business is difficult as you do not have access to loans. The easiest way is a Horizon Europe (Research, Innovation and Action) grant. This funding will help you to do business (e.g. train staff, implement new software). Horizon Europe wants SMEs and micro-companies and it is very hard to grow without grant funding.[7]

Especially for SSCs in the field of re-search and development one of the most important sources of funding is governmental grants. Most successful SSCs have relied upon this source of funding in the early stages and throughout their growth. There is a lot of funding available from European governments for SMEs and those that are aligned to innovation, and research and development. This is cheap and flexible capital but also requires work in terms of writing proposals and the length of process.

Horizon Europe is the EU's key funding programme for research and innovation with a budget of €95.5 billion. A new element of Horizon Europe is the European Innovation Council: 'Support for innovations with potential breakthrough and disruptive nature with scale-up potential that may be too risky for private investors. This is 70% of the budget earmarked for SMEs.' (source: Horizon Europe | European Commission (europa.eu))

Below are the areas that the European Innovation Council will support (source: European Innovation Council | European Commission (europa.eu)):

- **Pathfinder funding:** for advanced research, supporting early stage development of future and emerging breakthrough, market-creating and/or deep tech technologies
- **Transition funding:** to help researchers and innovators develop the pathway to commercial development for promising research results
- **Accelerator funding:** to support individual SMEs, start-ups and small mid-caps to bridge the financing gap between late stages of research activities and market take-up, to effectively deploy breakthrough, market-creating innovation and scale-up companies where the market does not provide viable financing
- **Additional activities** such as prizes and fellowships, and business added-value services

CEO tip

'From day one register for a PIC[8] number so that you are eligible for the European Grants.'
Andrew Beale, Chief Scientific Officer, Finden Ltd, UK

Customer financing and collaborations

In addition to governmental grants, starting the business based on customer sales is also a predominant feature of the SSCs. Customer financing is an appealing source for successful companies. By focussing on acquiring customers and using this to help fund and grow you are not distracted by any fundraising or proposal rounds. You are able to focus 100% on growing the company in line with the customer needs and problems to be solved.

For most companies, fast growing or otherwise, the early funding comes from a much more agreeable and hospitable source, their customers (Mullins, 2014). John Mullins is a lecturer at the London Business School and focuses on this theme of generating customer funding rather than focusing on VCs, angel investors, incubators and so on. He cites five approaches to this: 1) Matchmaker model (e.g. Airbnb) 2) Pay-in-advance models 3) Subscription models 4) Scarcity models & 5) Service-to-product models.
For SSCs it is worth exploring how to integrate and attract customers into the funding of the business and work out any collaborations as Simon Jacques, CEO from Finden Ltd, UK states: 'The next strand for Finden is now Intellectual Property (IP), they have spent time on their own R&D and in particular to generate their own IP and with a Partner.' The possibility to extend their business model and scale is now being realized after many years slowly growing and learning about their business.

There is also a possibility to have collaborations and partnerships through existing networks. Through the CAROTS Startup School we have evidenced that participants of the school and

[7] Simon Jacques, CEO, Finden Ltd, UK
[8] PIC number or Participant Identification Code is a unique 9-digit identifier for the European Commission to confirm your organisation's details. For example, it is necessary if you want to participate in any future Horizon proposals.

also existing CEOs of SSCs could come together and collaborate. This is a great synergy effect. Existing CEOs of companies could invest and take part in the founding of new SSCs and particularly with ones that could further extend their capabilities and offerings.

Angel investors and family office

Angel investors or family offices are groups of investors that provide funds for start-ups in exchange for an equity share of the company. Across Europe there are large groups of angel investors, philanthropists and family offices that look to invest their or their client's monies. There are many conferences where such investors are attending to see the next big ideas, view founders and make investment decisions.

The strengths of engaging with angel investors:

- Once you have founded an angel investor could be a good source of income to help grow your business. To engage with angel investors, you need a business plan and a business model canvas at the ready.
- They could take an active role within your company. For example, the connections, the network and the past experiences they have could all propel your business forward.
- It could be less risky than taking on a repayment loan. If the business fails then you are not required to pay back the money.
- Angel investors are far more likely to take riskier investments than banks.

The downsides of engaging with angel investors:

- If the angel investor wishes to take on an active role then you have to make sure they are aligned with your strategy and team working.
- As part of the commitment for investment you are giving away part of the future profits and also part of the returns if you ever sell the business. Most angel investors want a big exit and will want to exit, this might not align with your long-term goals.
- Locating the right angel investor and finding them can be a time consuming and stressful journey. This can take away from the actual service development, starting the business and finding customers process.

With regards to foundations and philanthropists there is a social finance agenda, looking for founders and a basis of companies that are putting back into society or helping to solve a major societal challenge. SSCs and those we have seen in the CAROTS Startup School are trying to help in areas such as cancer, 3D X-rays and improving materials analysis (applicable to many industries).
One participant from the CAROTS Startup School[9] cited that a combination of a Foundation (70%) and an Innovation Institute funding (30%) enabled them to found.

Other sources in the future

There are other sources of funding, some of which you have probably already heard of. These are crowdfunding, venture capital, mezzanine funding and Initial Public Offering (IPO). This chapter will cover crowdfunding and venture capital. In terms of mezzanine and IPO these are routes that can be explored when the company is ready to take on mergers, acquisitions, new markets or go public. For the SSCs that are founding this is in the distant future and an IPO is not always something a start-up company is looking to achieve.

Crowdfunding

This is a funding solution that is conducted via a platform where funds are raised by the founders by a community of external people. There are a number of sources out there with the most common type being a reward-based concept e.g. Kickstarter. This is a pledge system where people can provide funds to particular ideas of choice on a non-financial reward system. There are other crowdfunding routes such as equity based, lending and donations.

The benefits of crowdfunding:

- Based on a video or presentation you can reach a global audience for your business venture or idea.
- You can gain feedback and test your idea on a global scale.

The negatives of crowdfunding:

- In order to develop the campaign, there is much work to be done.
- If it is a reward-based concept then there is pressure for the business to start, grow and maintain. This may only be useful for products that can scale and have high margins.

[9] The Startup School was launched in 2021 as a pilot within the CAROTS project. It was attended by 11 participants from across Europe. Please see carots.eu for more details.

- You need to already build a community to help with the fundraising and have a great video that showcases your idea to the best ability to catch the attention and generate hype. With SSCs this could be hard to generate as there is no tangible product, it is a service that the general mass cannot see.

Venture capital

Venture capital (VC) is raising investment from individuals or professionally managed companies. These companies want to see proof of profitability or the ability to scale. They have a vast amount of due diligence and you need to be ready with a proposal and engaging pitch. For SSCs this is not a preferred route as they are really focussed on high growth potential with products that are scalable. They take great risk and demand a high rate of return. Particularly in the early stages of growth a VC model is not suitable.

The benefits of engaging with VCs:
- With huge investment they can scale and speed up the growth of a business.
- Enables a higher speed of growth and potential to fail early on is removed due to the availability of funds.
- With funds you will be able to attract talent to the business.
- VCs can bring networks and offer support.

The negatives of engaging with VCs:
- The fundraising process can be stressful, it takes time and the resources of the company and founders to complete the proposals and pitches.
- As founders you will lose equity in your company and control.
- VCs expect an exit at some point and therefore you are committing your company to an end date.

With many SSCs, it is seen that a VC model is not suitable, the scalability, the loss of control and the exit is not always part of the strategy and business model.

Concluding thoughts on funding solutions for SSCs

As there are many sources of funding available to SSCs, it is important for the founders to select the most suitable source that aligns with their ambitions and strategy of the company. As we have seen with our existing successful companies and the participants of the CAROTS Startup School, it is possible to grow a company whilst keeping an academic career and look within their near vicinity for funding (e. g. personal savings, friends and family, grants). It is important for these new founders to cultivate their networks, to find partnerships and acquire customers. It is possible for growth from these areas whilst they learn how to become an entrepreneur. However, it is important that as they grow they keep their eye on the other possible sources of funding and, when needed, be ready.


photo: Solid-Chem GmbH/Erik Schwarzer, Grubenglück

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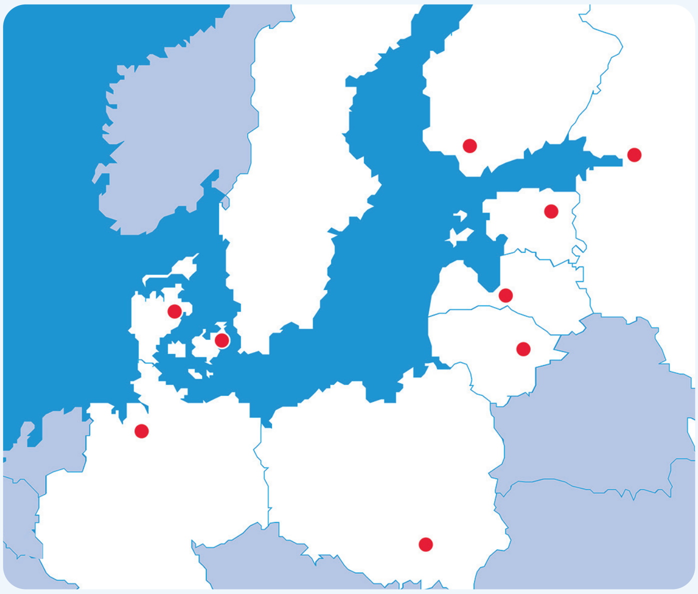

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