



BAVARIA MEETS FINLAND

Market analysis of the Bavarian and Finnish start-up scene

University of Applied Sciences Augsburg
An der Hochschule 1
86161 Augsburg
T +49 821 5586-0
F +49 821 5586-3222
www.hs-augsburg.de

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1. Project

Start-ups are an important driver for our economy as they are creating a lot of new jobs and are making innovations possible. It was found out, that they tend to work more on breakthrough innovations, in comparison to big corporations that prefer to work on innovations with minimal risk. Due to this mind-set they are able to create new markets and enhance the many people's life.¹

Through globalisation it became very important to connect, in order to keep up with dynamic markets and fast changes. The challenges also created opportunities like entering new regions and markets or developing international ideas. When it comes to founding a business, it is also essential to consider various factors like the political situation, developing opportunities, support systems etc. Therefore, it could also make sense to start a business away from one's home country.

Moreover, do the branches of the Automotive, Clean Tech and Life Science/Health Care industry show great potential in growth, opportunities and innovations. One reason for this development is digitization which is making a lot of everyday life challenges easier, like data-mining or optimising processes.

In this project we want to show the opportunities which Finland and Bavaria, two very interesting regions, offer in these three industries and give information about the reasons for starting a business there by analysing the market of the start-up scene in those areas. Furthermore, an insight into Finnish and Bavarian start-ups and will be given. Additionally their experiences regarding financing and funds, developments, support centres and valuable views on the current situation and future perspectives in those three branches will be presented.

Our Research results were generated through interviews with start-ups, experts of the branches and start-up centres. With the interviews in Germany, we were able to attend the Helsinki start-up festival and present our information in front of Finnish start-ups and teams who want to start a business, encouraging them to consider Bavaria as a suitable location to seed their business ideas by providing them with helpful information.

As we also wanted to give Bavarian start-ups and potential future start-ups the opportunity to have an insight into the Finnish start-up scene, we took the chance on meeting Finnish start-ups and interviewing them on their experiences as well. With all this information the project was concluded with a start-up day at the university in Augsburg and were able to inspire people to explore more opportunities and chances outside their own country.

The project was initiated and supported by a cooperation with NewCo Helsinki which provides business advisory and start-up services, with the aim to support entrepreneurs as well as existing companies who want to grow in the area of Helsinki. Furthermore they are offering their facilities to over 200 events every year. NewCo Helsinki was founded in 1992 and since then over 20,000 businesses have been established. With their support over 80% of the business were able to still continue their activities five years later. We want to thank them for the international cooperation and the chance to carry out this interesting market analysis.

¹ <https://www.forbes.com/sites/petercohan/2011/06/27/why-start-ups-matter/#300e3da03620> (28.04.2018)

2. Overview of the Start-up scene

2.1. Definition

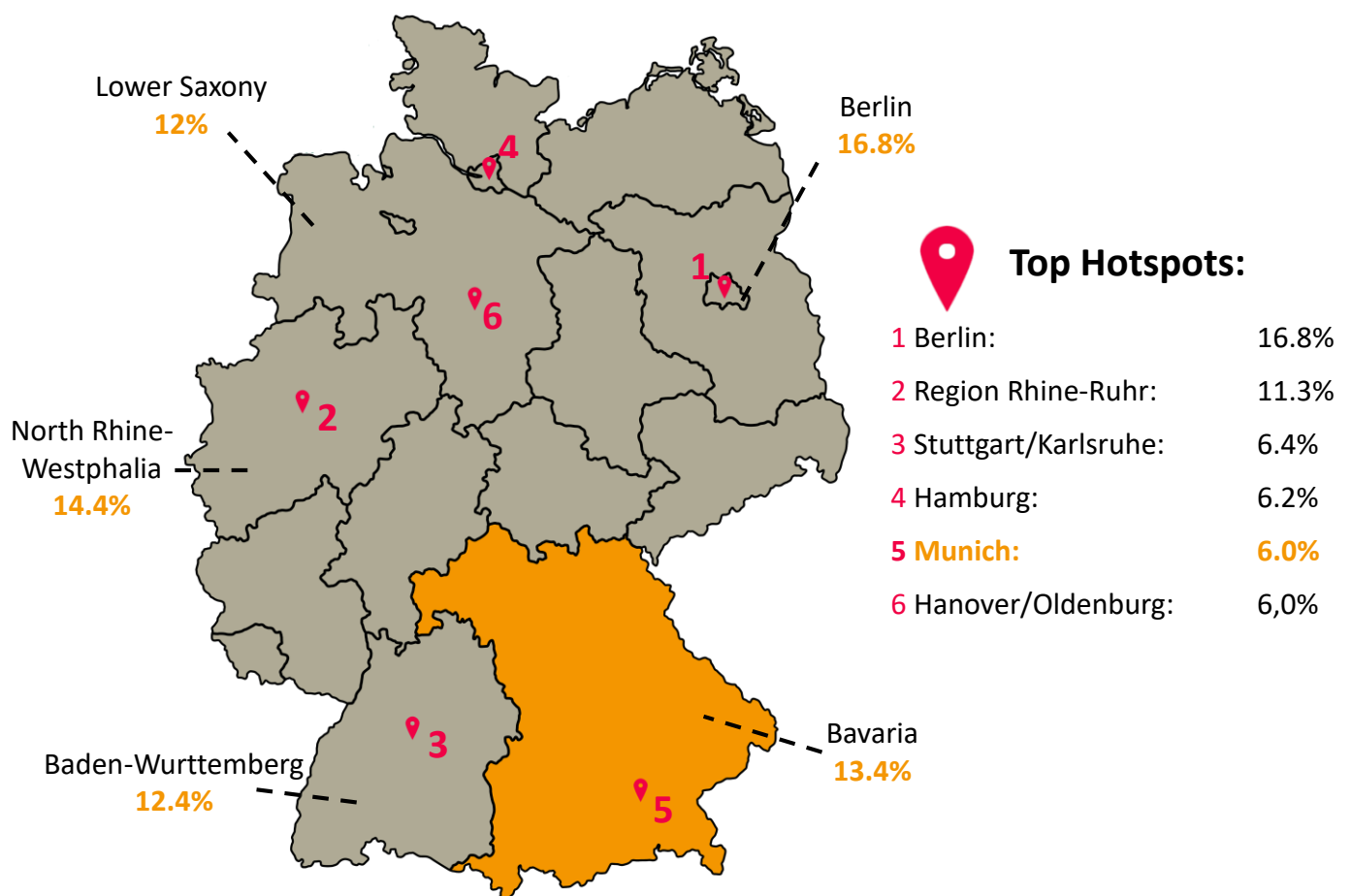
According to the KfW Gründermonitor² 672,000 people started their own business in 2017 but the majority of those new businesses are not considered as start-ups. The consultancy KPMG defines a start-up as a young and innovative company which is not older than 10 years. They feature highly innovative technologies or business models, mostly based on an it-foundation. One of their goals is a significant growth in employees and sales.

2.2. Statistics

2.2.1. Germany

■ Federal states and hotspots in Germany

69% of the German start-up scene are based in five of the 16 federal states of Germany. Besides the capital Berlin, Bavaria is ranked the third most popular place for founders in Germany and its state capital Munich is one of the founding hotspots. Especially Berlin and Hamburg are well known for founders and innovative start-ups.



Source: German Start Up Monitor 2017

² Metzger Georg, KfW Gründungsmonitor 2017

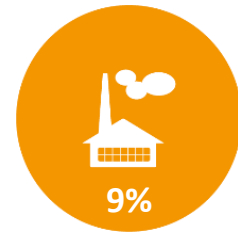
Industry sectors in Germany



IT/Software



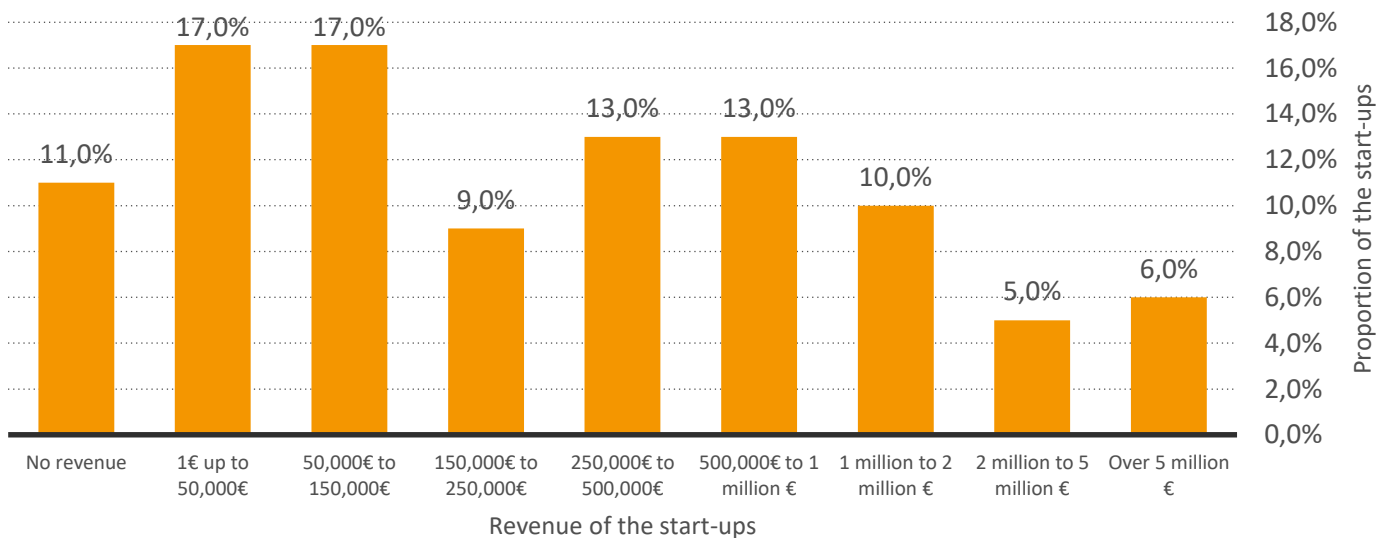
Software as a Service



Industrial Technologies

One third of the German start-ups are based in the IT and Software industry followed by founders assigning to industrial technologies, like the automotive industry. Together with the consumer industry driven start-ups, like the E-Commerce Sector (7%) combined with the Online-Marketplaces (5%), those companies make up more than 50% of the young market. 30% are divided equally to agencies, biological and medical Technologies, FinTechs, Service-Portals, Food and Media Industry. The remaining 20% are companies of various other industries.³

Revenue classes in Germany



Source: Deutscher StartUp Monitor 2017

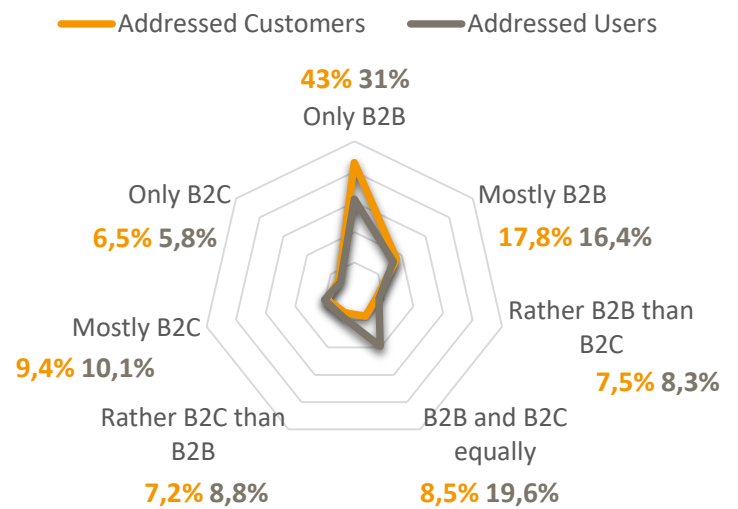
- Every fifth start-up has a revenue of over one million € a year
- In the first stages of founding a start-up the main focus is based on developing ideas and testing, therefore 25% of the start-ups earn less than 50,000€ a year

³ Kollmann/Stöckmann/Hensellek/Kensbock; Deutscher Startup Monitor 2017; 2017

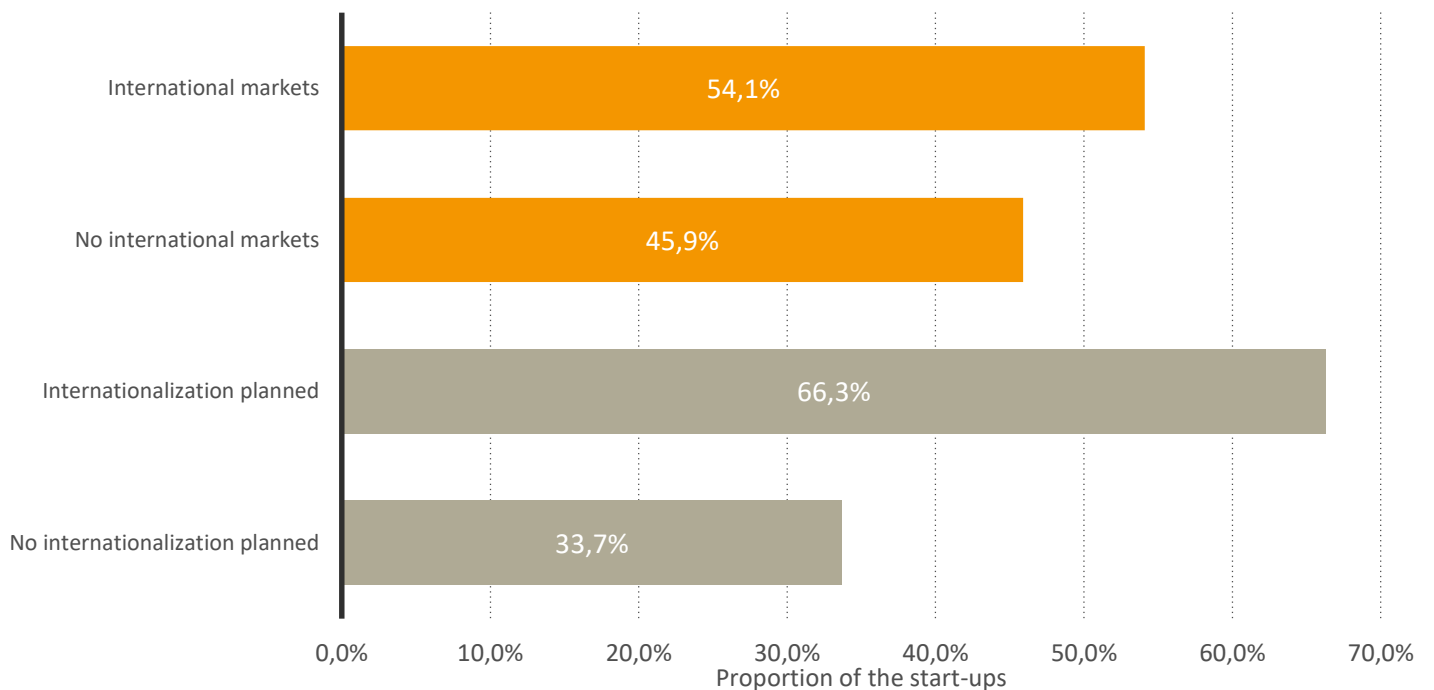
Addressed customers in Germany

More than 50 percent of the companies generate their revenue through their B2B business. Even if the product is sold mostly to the B2B customers, the end user often is a private customer. For example: A license for a Healthcare App is sold to a Health Center (B2B customer) but the patients are the actual addressed users of the product.

Source: Deutscher StartUp Monitor 2017

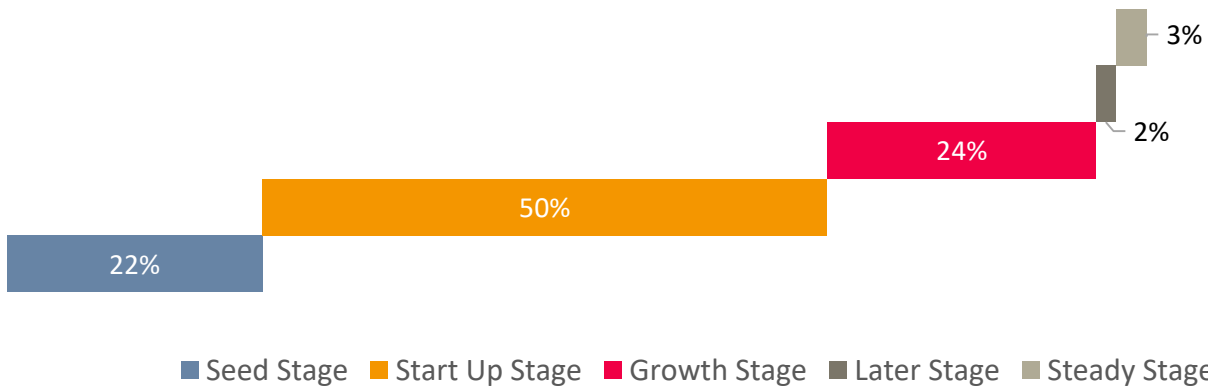


Internationalization



Source: European StartUp Monitor 2016

Current Developmental Stages



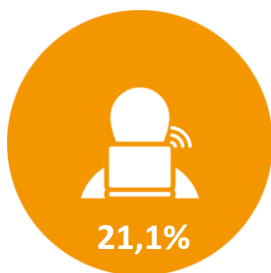
Source: European Startup Monitor 2016

Half of the German start-ups just launched their business and are currently selling their first products and services while collecting feedback and improving their ideas. Nearly a quarter are currently developing an idea and setting up the business plan or are one step further and have already generated a consistent source of income and can now focus on growing and developing new regions.



2.2.2. Finland

Industry sector and Innovation in Finland



Software as a Service

Innovation Ranking Worldwide

#1 Product Innovation

#2 Business model innovation

#3 Process innovation

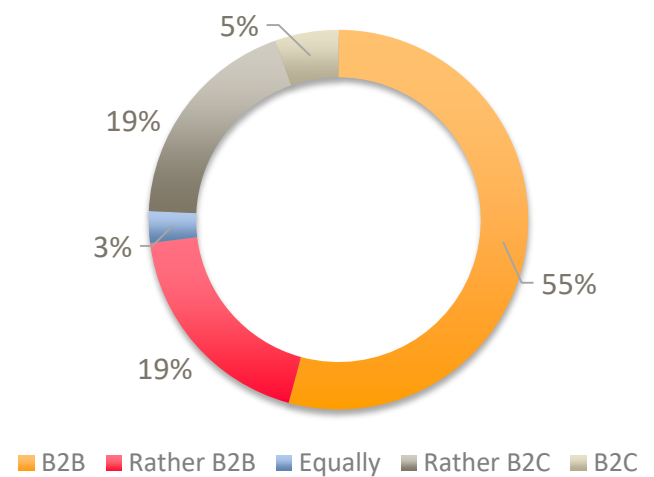
European Startup Monitor 2016

Compared to other countries, Finland can be considered as the global leader in product innovation. When it comes to Business model innovation Finland is ranked second, right between Ireland on the first spot and Israel on the third. Ireland and Israel also have slightly better process innovations but Finland is only a few percent away from them.

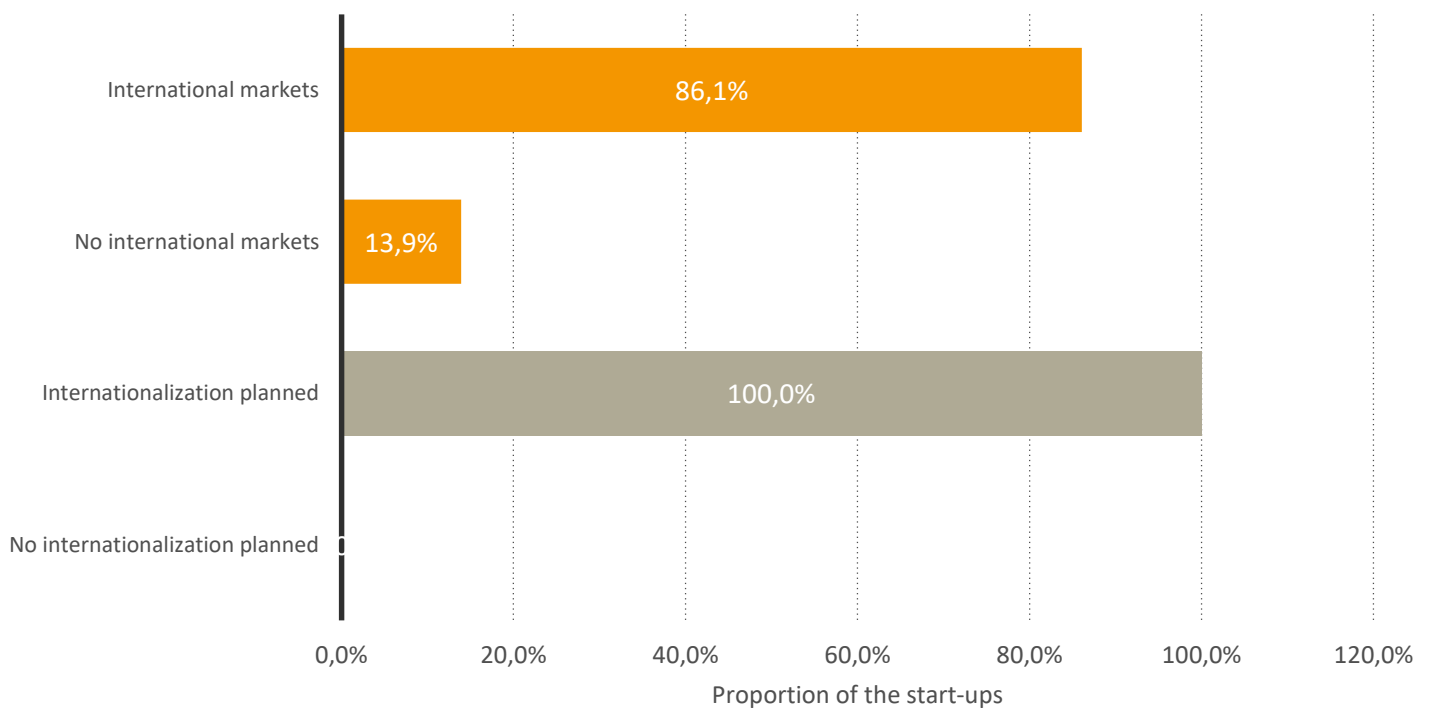
Addressed customers in Finland

The comparison of Finland and Germany shows that they are both mainly focused on the B2B market. While the German start-ups do have a higher focus on only B2C business the Finnish companies do have a slightly higher focus on B2B.

Source: European Startup Monitor 2016



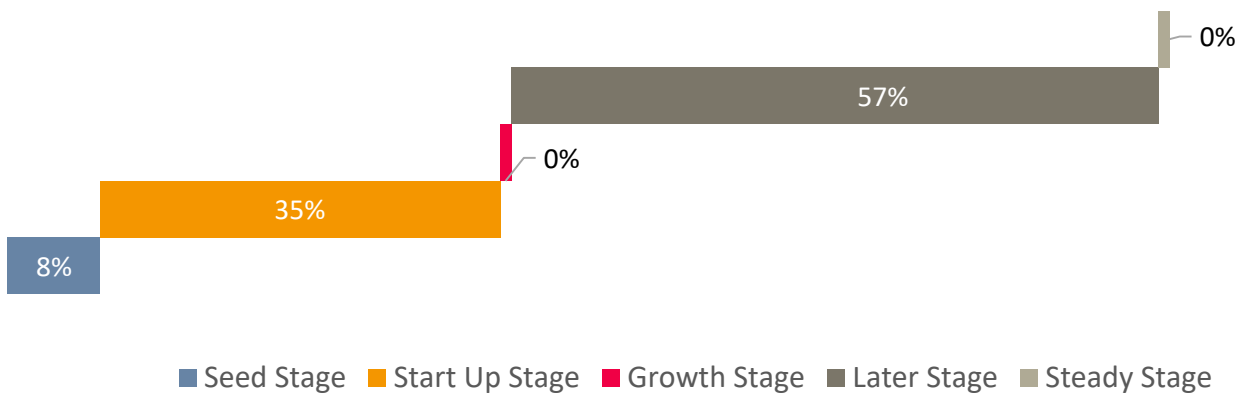
Internationalization



Source: European Startup Monitor 2016

The international orientation in Finland is much higher in comparison to Germany. Looking at the current and future situation there are significant differences between the two countries. While Finland dominates (86.1%) the international markets, Germany seems not to be very active (only 45.9%). Finland is interested in increasing their degree of internationalization, whereas a third of the German start-ups do not have any plans to internationalize their business.

Current Developmental Stages



Source: European Startup Monitor 2016

Almost half of the German start-ups are located in the start-up stage. In comparison to Finland, where over a third of the start-ups are in this stage. It is remarkable that more than half of the start-ups in Finland have reached the later stage. In Germany there are twice as many start-ups in the seed stage than in Finland.

2.3. Start-up Founders and Employees

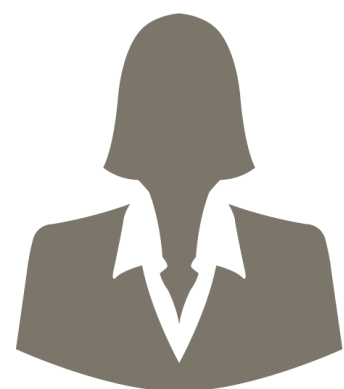
2.3.1. Germany

Age and Gender



85% Male

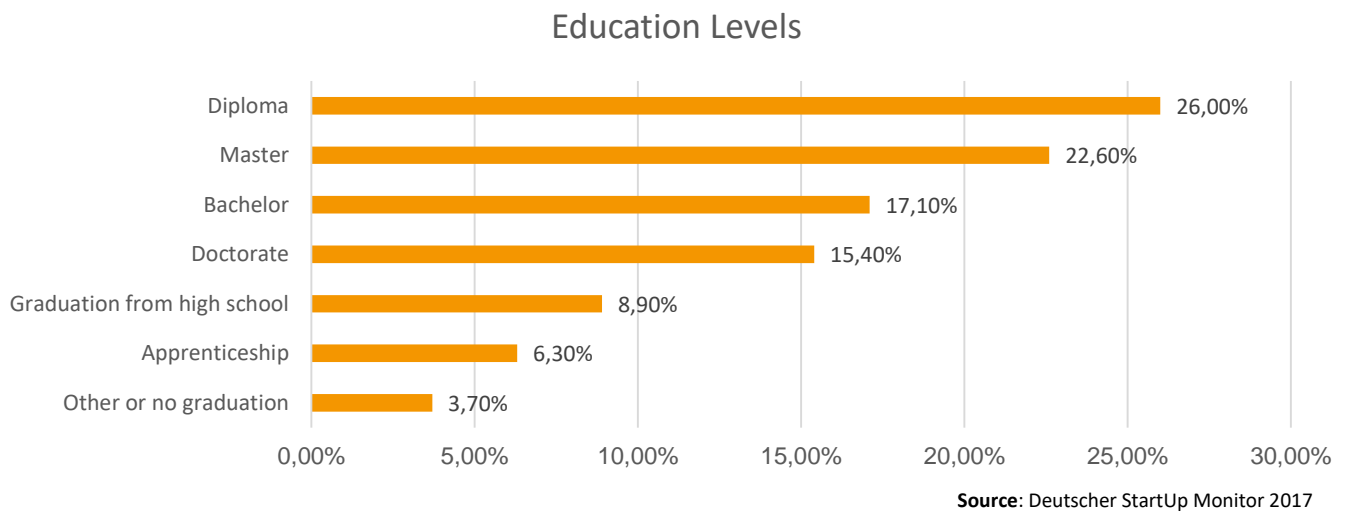
18 – 24 years	6%
25 – 34 years	48%
35 – 44 years	30%
45 and older	16%



15% Female

Source: Deutscher StartUp Monitor 2017

Founders' educational level



Average number of founders & employees

2 Founders

12 Employees

Source: European Start Up Monitor

Citizenship



92% Same Country



3,8% EU-Country



4,2% Non-EU Country

Source: European Start Up Monitor

Motivation

The desire to realize a business idea and the strong confidence in it, is the main motive for the majority of German founders. A study by PWC⁴ showed that the founders are passionate about their product and love the possibility to apply their interests to the project. Only 20% of the start-ups are founded with the intention of an exit. Being their own boss and the responsibility for the success of the company is much more relevant.

⁴ <https://www.pwc.de/de/startups/startup-studie-2017.pdf> (02.05.2018)



2.3.2. Finland

Age and Gender



84% Male

18 – 24 years	8%
25 – 34 years	37%
35 – 44 years	32%
45 and older	23%



16% Female

Source: European Start Up Monitor

Average number of founders & employees

3 Founders

13 Employees

Source: European Start Up Monitor

Citizenship



79 % Same Country



12 % EU country



9 % Non-EU country

Source: European Start Up Monitor

Nearly most of the German start-ups are founded by German citizens, while every fifth founder in Finland is a foreigner. The reason for this difference could be the immigration politics and advanced digital infrastructure for start-ups in Finland.

2.4. Stages of a start-up

As a start-up it is essential to know in which stage the company is currently placed to gain background information and to know what challenges maybe have to be faced. It is a journey from the idea to start-up, and if successful, through to the growth and maturity phases. Depending on the business and the industry, not every start-up goes through every stage. Furthermore, it is possible that the chronological order changes for a start-up, some may even leave out stages.

I. Seed Stage

This is the very beginning of the business lifecycle, before the start-up is even officially in existence. An idea is developed and colleagues, business associates or any industry specialists are being consulted to get advices and opinions on the potential of the business idea. In this phase mostly one person or a vague team is responsible for the setup of the business. It is possible that a business plan is developed, and the mission and vision is defined. As there is no existing product yet, no revenues are made either.

II. Start-up Stage

As soon as the business idea is fully developed, it is time to make it official and launch the start-up. The first products/services are sold and based on the feedback of the first customers the product is improved, which leads to a lot of changes of the offering. Through this process the right business model is created.

III. Growth Stage

The business should now generate a consistent source of income and regularly take on new customers as the concept is proven. Cash flow should start to improve as recurring revenues help to cover ongoing expenses, and the profits are likely to improve slowly and steadily. To keep up with the speed of the business it is necessary to spend a lot of time in the recruitment process. As the team is steadily growing, it is also important to clearly define and to focus on common goals. For the founder it is essential to come into the role as head of the company. Furthermore, the company should keep track of the competition and the requirements of the market. At this point it is easier to attract significant funding.

IV. Later Stage

All involved are getting into a routine and feeling comfortable with the daily-business. The business itself has established its presence within the industry. Now it is time to carefully plan on expanding the offerings and/or enter in new regions. On the one hand it is crucial not to get too comfortable as the industry is fastly changing and the business has to keep up with this. On the other hand, it is also important to carefully and realistically plan the next steps.

V. Steady Stage

The business should now be seeing stable profits year-on-year. Compared with all other stages it is easy to attract financial and human resources. It could be said that entrepreneurs here are faced with three choices: continue as up to now, push for further expansion or exit the business.

2.5. Financing options for Start-ups

2.5.1. Germany

a) Methods of financing

Internal financing

▪ Self-Financing without equity:

Sweet Equity: Unpaid labor of the founders in the early phase.

Moonlighting: For the capital formation in the start-up phase, company founders simultaneously pursue an additional activity. As they usually do so outside of the time spent on a start-up project, mostly in the evenings, the term "moonlighting" has become established for this activity. It can be useful in the seed-phase.

Advance Payment: Particularly in the project business, a down payment may be required from the customer due to the high project scope. However, such an agreement is only possible if the project is of high urgency and importance to the customer.<sup>5 [L]
[SEP]</sup>

▪ Self-Financing with equity:

Bootstrapping: Bootstrapping generally refers to the financing of a start-up from its own savings, as well as the financial support of related persons ("Family and Friends").⁶ Furthermore, founders often resort to additional methods to increase their financial base without raising money from traditional sources. Useful methods can be, for example, the negotiation of payment periods with suppliers or the utilization of credit lines.⁷

External financing

▪ Equity financing:

Business Angels: A business angel is an independent individual who provides capital for the development of a business.⁸ Typically, wealthy people, business angels (or angel investors) aim to help entrepreneurial individuals succeed with a business idea by investing their own money (usually up to 500.000€).⁹ This private investor not only provides money, but also generally is interested in becoming involved in the project by acting as a guide or mentor.<sup>10 [L]
[SEP]</sup>

Accelerators: They support the founding team in the early stages with ideas, teams and processes and in return receive an equity share in the start-up. Accelerators thus have a direct impact on the operational implementation of the business idea.<sup>11 [L]
[SEP]</sup>

Venture Capital: Venture capital generally comes from well-off investors, investment banks and any other financial institutions. The financing volume is significantly higher than that of business angels due to the institutional nature

⁵ Schultz, C., Die Finanzierung technologieorientierter Unternehmen in Deutschland, 2011, p. 107

⁶ Hahn, C., Finanzierung und Besteuerung von Start-up-Unternehmen, 2014, p. 43

⁷ Schultz, C., Die Finanzierung technologieorientierter Unternehmen in Deutschland, 2011, pp. 108-109

⁸ Hahn, C., Finanzierung und Besteuerung von Start-up-Unternehmen, 2014, pp. 36-37

⁹ Malte Brettel/Markus Rudolf/Peter Witt, Finanzierung von Wachstumsunternehmen, 2005, p. 81

¹⁰ Hahn, C., Finanzierung und Besteuerung von Start-up-Unternehmen, 2014, pp. 36-37

¹¹ Hahn, C., Finanzierung und Besteuerung von Start-up-Unternehmen, 2014, p. 55

and the pooling of several investment companies into VC funds.¹² VC is determined as risk capital because there is no repayment obligation or a right of termination for the creditor.¹³ ^[13] ^[SEP]

Private Equity: The investor acquires company shares for a limited period of time through his participation and can thus generate financial returns. One important difference between venture capital and other private equity deals is, that venture capital tends to focus on emerging companies, seeking substantial funds for the first time, while private equity often tends to fund larger, more established companies, that are seeking an equity infusion or a chance for company founders to transfer some of their ownership stake.¹⁴

■ Debt financing:

Debt financing: includes all financial resources made available to the company by external third parties.¹⁵ ^[15] ^[SEP]

Debt capital is usually provided to the company in the form of long- and medium-term loans and short-term loans.¹⁶ When starting a business with the principal bank, it is often agreed that repayments and interest on the loan only begin after a certain period of time, since the special circumstances of the start-up situation, as well as the limited liquidity in the start-up phase, are taken into account.¹⁷

In the case of long-term debt financing, the capital is lent for more than five years, with a medium term of up to five years. These are often referred to as investment loans or real loans and are used to finance operating assets and construction in the context of a business start-up.¹⁸

Short-term loan financing includes types of loans such as customer prepayments, supplier loans, current account loans and aval/lombard loans with a term of less than one year.¹⁹ The aval loan offers the company a financing option through the bank's credit rating. The bank acts as a guarantor for the borrower and is liable to the borrower in the event of a loan default.²⁰ In contrast, the Lombard loan is understood as a loan which is secured by attachable movable property or certain rights of the borrower.²¹ ^[21] ^[SEP]

■ Mezzanine capital:

Mezzanine capital: is understood as a hybrid financing instrument between the legal and economic composition of equity and debt capital. If a business owner wants to combine the benefits of equity and debt financing, mezzanine finance can be beneficial.²² ^[22] ^[SEP]

At will, an increased focus may be placed on more equity-intensive financing ("equity mezzanine") in the form of profit participation rights or certificates or atypical silent participations. In contrast, there is also the possibility to use a typical silent participation or subordinated loan and thus debt capital ("debt mezzanine").²² The advantage for investors here is that they participate in an increase in the value of the start-up through the combination of external and self-financing, but without the repayment claim being influenced by the respective corporate development. Above all, start-ups profit from the fact that no voting rights have to be granted by the participation and thus no dilution of ownership occurs. In addition, no collateral is needed for financing, which can be very beneficial for young companies.

¹² Kollmann, T./Kuckertz, A., E-Venture-Capital, 2003, pp. 23–26

¹³ Malte Brettel/Markus Rudolf/Peter Witt, Finanzierung von Wachstumsunternehmen, 2005, p. 79

¹⁴ Schultz, C., Die Finanzierung technologieorientierter Unternehmen in Deutschland, 2011, p. 114

¹⁵ Schultz, C., Die Finanzierung technologieorientierter Unternehmen in Deutschland, 2011, p. 118

¹⁶ Kollmann, T., E-Entrepreneurship, 2016, p. 358

¹⁷ Kollmann, T./Kuckertz, A., E-Venture-Capital, 2003, p. 33

¹⁸ Malte Brettel/Markus Rudolf/Peter Witt, Finanzierung von Wachstumsunternehmen, 2005, p. 165 f.

¹⁹ Vogelsang, E./Fink, C./Baumann, M., Existenzgründung und Businessplan, 2015, p. 101

²⁰ Malte Brettel/Markus Rudolf/Peter Witt, Finanzierung von Wachstumsunternehmen, 2005, p. 166

²¹ Nitsch, K. W., Bankrecht für Betriebswirte und Wirtschaftsjuristen, 2014, p. 115

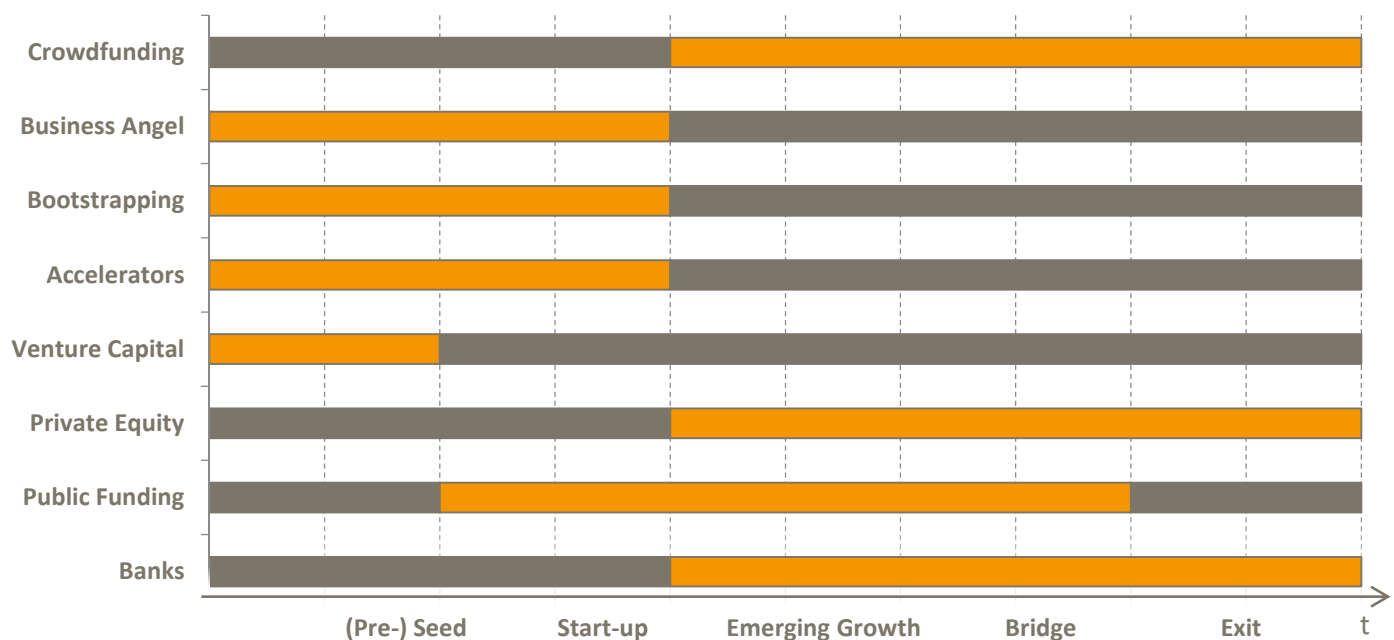
²² Vogelsang, E./Fink, C./Baumann, M., Existenzgründung und Businessplan, 2015, p. 98

In terms of balance sheet analysis, the advantage is that mezzanine capital is recognized as an economic equity, which therefore represents a better balance between equity and debt. Not only does this improve the balance sheet structure, it also increases creditworthiness.²³ ^[SEP]

Other financing

Crowdfunding: basically means mobilizing potential donors on internet-based crowdfunding platforms, with the aim of obtaining financial resources for a project with or without consideration and thus fulfilling a certain purpose.²⁴ For start-up founders, crowdfunding therefore represents a useful alternative to conventional sources of debt, as there are not enough funds for the start-up projects.²⁵ One distinguishes between four types of crowdfunding, depending on the particular form of consideration for the support of the project. Considerations can be monetary as well as non-monetary. Monetary: Lending-based Crowdfunding (e.g. auxmoney) and Crowdinvesting (e.g. Bergfürst, Campisto, Seedmatch). Non-monetary: Reward-based Crowdfunding (e.g. Startnext) and Donation-based Crowdfunding (e.g. betterplace.org)²⁶ ^[SEP]

b) Financing options in the different stages of development



Source: Adapted from: Hahn, Christoph (2014), S.78

²³ Hahn, C., Finanzierung und Besteuerung von Start-up-Unternehmen, 2014, p. 41

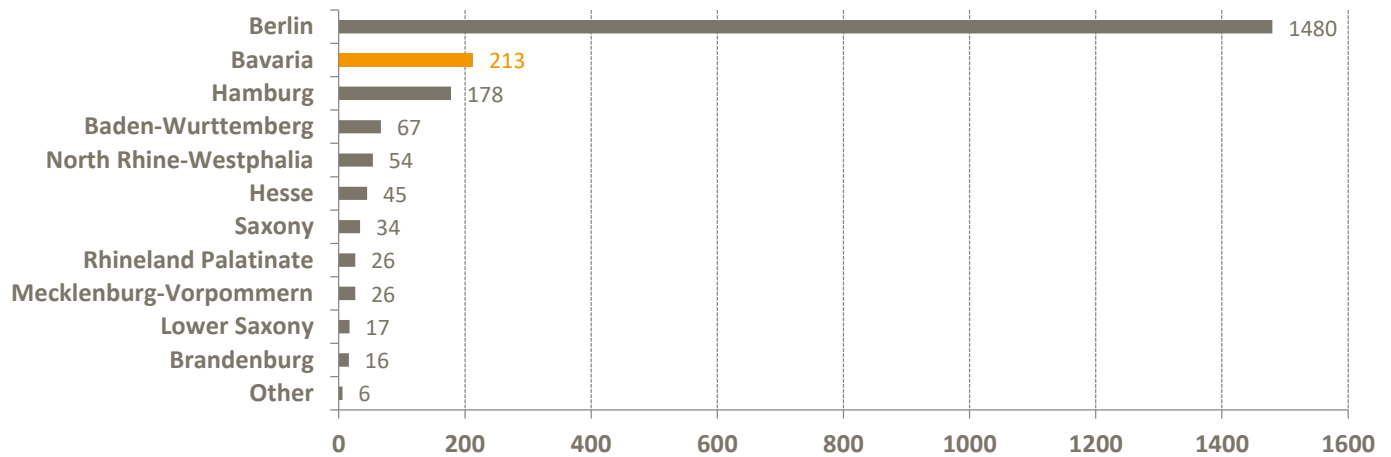
²⁴ Hemer, J. u. a., Crowdfunding und andere Formen informeller Mikrofinanzierung in der Projekt- und Innovationsfinanzierung, 2011, p. 1

²⁵ Schramm, D. M./Carstens, J., Startup-Crowdfunding und Crowdinvesting, 2014, p. 6

²⁶ Orthwein, I., Crowdfunding, 2014, S. 17

c) Further Statistics regarding start-up financing in Bavaria

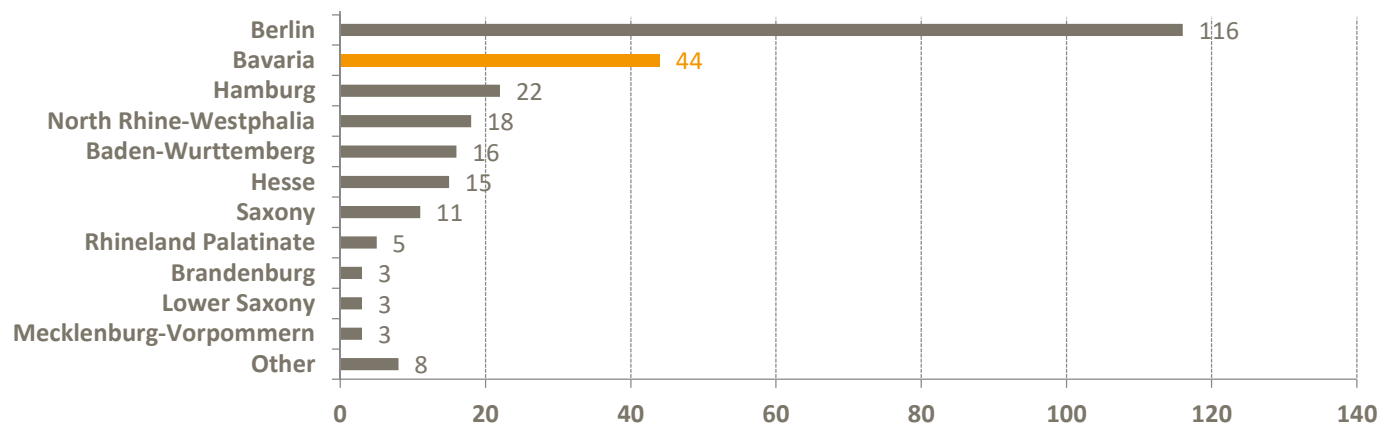
- Financing amount for each Federal State in 2016



Source: KfW Gründermonitor 2017

➔ It can be seen that regarding the financing amount Bavaria is in the second position behind Berlin.

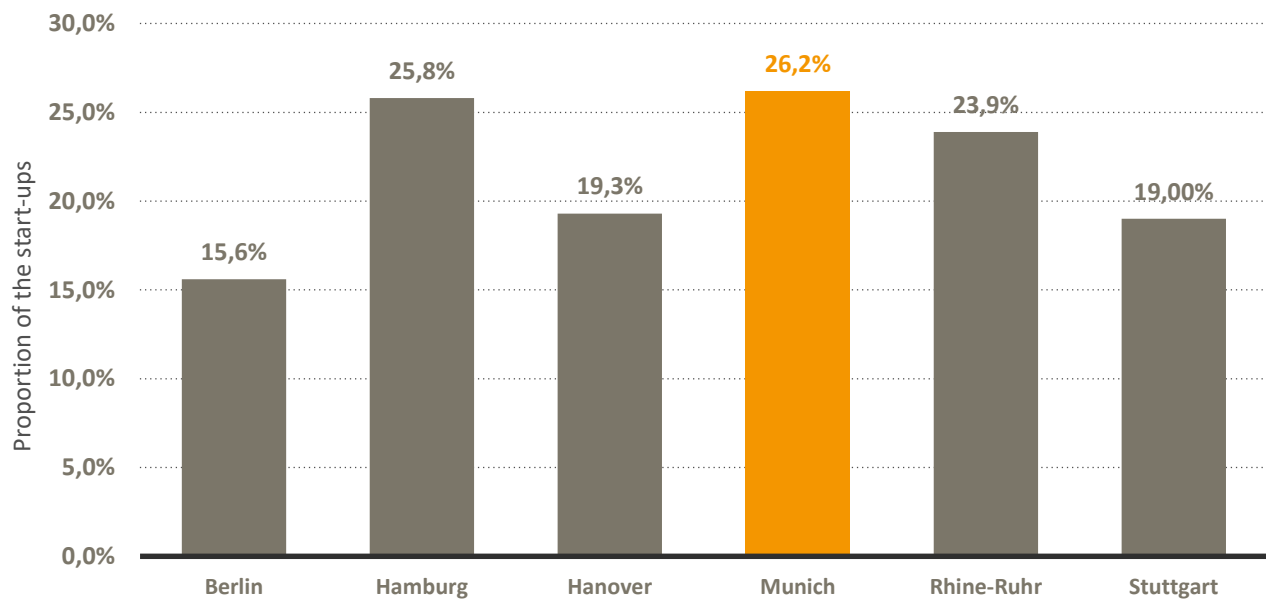
- Rounds of financing for each Federal State in 2016



Source: Start Up Barometer 2017

➔ It can be seen that reading the rounds of financing Bavaria is also in the second place behind Berlin

Financing exclusively from own savings in 2017



Source: Deutscher Start Up Monitor

- ➔ Relating to financing exclusively from own savings with 26.2% Munich (indirectly representing Bavaria as major hotspot) is at rank one.



2.5.2. Finland

a) The path to a Finnish enterprises' value

FFF - Family, Friends and Fools: Nearly all the companies of this project had used this sort of funding in the very beginning and yet, it is most often overlooked in scientific studies. The prime source of equity for the first month least should be, Family, Friends and Fools or FFF for short. FFF means basically, all of the money a person can pile up from the people around him. It could be a neighbor, uncle or a Christmas bonus.

Starttiraha refers to the sum of money given to an individual to start up a company. The purpose of this government aid is, to support the individual during the time he or she is not earning any money from the start-up. It can be paid for up to 18 months, and it ranges from 32.46 €/day up to 51.94 €/day, depending on the case. Often an entrepreneur goes through an entrepreneurship course through a TE-office (The Public employment and business services of Finland). Anyone can apply for the Starttiraha, and it can be done easily online or directly at a TE-office.²⁷

²⁷ http://www.mol.fi/mol/fi/04_yrittaminen/05_starttiraha/ (28.04.2018)

Protomo is a relatively new support organization in Finland. Protomo is a business development community for start-ups in Finland, but they also offer a small amount of funding for certain companies. They help start-ups with setting up their company & partner the business with a pool of talent available. Protomo makes an idea commercially viable with the start-up enterprises, which will at the end, stand on their own feet. Protomo's goal is to provide support with local and networking services. They provide new start-ups with facilities, where they can work on their project, with support in pitching ideas to potential investors through experience and the support of the community. The services of Protomo are free, but potential advisory services are paid.²⁸

The New Entrepreneur Agencies (Uusyrityskeskus in Finnish) are part of the support network created in 1989. It is not a government agency, but it works very closely with the government, big companies, funds, and other localized business incubators and organizations. The main objective of Uusyrityskeskus is to provide free information and expert advice for anyone aspiring to become an entrepreneur. Uusyrityskeskus boasts with a staggering number of 104,251 new companies set up since 1989 and only 10% of those companies have stopped within the first 2 years. In the first five years only 4% of the clients of Uusyrityskeskus went bankrupt.²⁹ Uusyrityskeskus has a branch specialized for women called Women's Enterprise Agency. Their goal is to encourage women to become entrepreneurs. It is funded by private enterprises and the Ministry of Employment and Economy.³⁰

Finnpartnership is a Finnish, nationwide, support organization. It provides financial and advisory support for any project, regardless of business sector. It focuses on establishing business connections between Finland and developing countries listed by the OECD. It provides matchmaking services across all of the OECD developing countries. Finnpartnership offers all of its services for free. Finnpartnership covers up to 70% of travel expenses for SMEs during their project to a developing country.³¹

Finnfund is a Finnish development finance company. They offer long term finance in ventures with a Finnish interest. These ventures are strictly situated in developing countries and Russia. Finnfund is a very similar organization to Finnpartnership. Companies from any sector can apply for Finnfund financing. Enterprises are encouraged to contact Finnfund as early as possible to formulate a complete project plan. It is highly recommended for enterprises targeting a developing country to work with Finnpartnership and Finnfund.³²

Foundation for Finnish Inventions or "Keksintösäätiö", is a foundation that screens and evaluates inventions and innovative ideas generated by private persons and start-up companies. The main purpose of this foundation is to develop a product or service.³³ The money from Keksintösäätiö is basically a loan for 12 years, which has to be paid back in full.

Sitra usually funds projects that promote well-being and sustainability start-ups. But sometimes they also fund start-up companies in their 1st and 2nd round of funding. In 2012 Sitra started a special fund called "Start-up –fund". It will hold Start-up Sauna business incubator events in the future and Slush-Conferences. Slush conferences are leading start-up conferences in Northern Europe and Russia. They often have high-end key speakers such as Prime ministers and CEOs of multinational companies.³⁴

²⁸ <http://www.leadingpartners.fi/wp-content/uploads/2013/05/Esite-Protomo-startup-valmennusohjelma.pdf> (28.04.2018)

²⁹ <https://www.uusyrityskeskus.fi/tietoa-meistä> (28.04.2018)

³⁰ Kärki, J., The Support Possibilities of a Starting Entrepreneur, 2009

³¹ <http://finnpartnership.fi/fi/developing-business-together/> (28.04.2018)

³² https://www.finnfund.fi/tuotteet_ja_palvelut/en_GB/instruments/ (28.04.2018)

³³ Uotinen, E., Rahoituslähteiden selvitys aloittelevalle pk-yritykselle, 2013

³⁴ <https://www.sitra.fi/uutiset/startup-saatio-polkaistiin-kayntiin/> (28.04.2018)

TEKES is the most important public funding organization in Finland. They funded 65% of well-known Finnish innovations between 1985 and 2009. Out of the 50 fastest growing technology companies in Finland 47 were TEKES clients. TEKES can be translated with Employment and Economic Development Centre, and its main objective is to increase the national GDP through innovation. It is deeply integrated with universities and polytechnics to fund research projects. It is publicly financed by the Finnish government. ELY centres work closely with TEKES as they provide TEKES funding through the nationwide network already established by ELY centres in Finland³⁵

ELY –Keskus (Centre for Economic Development, Transport and the Environment in English) is a government organization. The centres work locally to support the founding of an enterprise, advisory services and funding. Furthermore, ELY centres receive funding from the Finnish government and from the EU. These funding are available for start-up enterprises, but also for existing enterprises to help them expand and develop. ELY centres offer a variety of courses for start-ups to attend, some of them are free. These courses might help an enterprise to get a global view of the markets, formulate a business plan or help to plan investments.³⁶

Commercial banks: Interviews with start-ups revealed that most of them had used commercial banks as one of their primary sources for funding in the seed stage. Commercial banks give out loans to start-ups and the loans are backed up by the Finnish government through Finnvera or by the entrepreneurs themselves. Some enterprises might adapt cash flow financing as a strategic decision. It is a way of a loan from a bank to generate cash flow prior to selling anything. It is often given out on estimated revenues.

Finnvera is a government-run organization, providing financing in the seed and growth stages of an enterprise. Its objectives are to increase exports from Finland, increasing the number of start-ups and to support enterprises when there are changes. Finnvera operates mostly by granting or backing loans for companies. It gets the funds from the financial markets. An enterprise seeking for financial aid from them doesn't have to decide what kind of support it needs, but rather Finnvera will tailor its financing model for the needs of any enterprise. Finnvera guarantees loans in several ways. The most modest type of guarantee is called Pienlaina – small loan. It can be provided for anyone, even if the enterprise is receiving a different type of funding from Finnvera. Pienlaina is always between 5,000 and 35,000 €. A company must employ at most 5 people to be eligible for Pienlaina.³⁷

Suomen Teollisuussijoitus (TESI) is "Finnish Industry Investment". They invest in companies directly during the 1st & 2nd round of investment. They also do investing through various funds, but no seed investing. TESI takes a minimum of a 10% stake in a company when investing, but never a majority share, and often a membership on the board of the enterprise comes with it.³⁸

FiBAN - Finnish Business Angels Network. The network covers about 450 angels around Finland. Before 2012, Finnvera also had business angel activity, but it has since moved to FiBAN in 2012.

According to an Aalto University study, Finnish business angels have a net worth between 1 and 5 million €. To receive funding from a business angel, an enterprise must spark the angel's interest and prove its' potential. Business angels are syndicate investors, which means they invest as a group of business angels. In many cases business angels invest with other business angels to reduce and distribute the risk of investing.³⁹ Business angels do not only provide capital to keep the enterprise going, but also operational mentoring. Most business angels were entrepreneurs prior to being angels.

**ANGELS
INVESTED €53M**
**in 324 STARTUP
COMPANIES**

³⁵ <https://www.businessfinland.fi/suomalaisille-asiakkaille/etusivu/> (28.04.2018)

³⁶ <http://www.ely-keskus.fi/en/web/ely-en/> (28.04.2018)

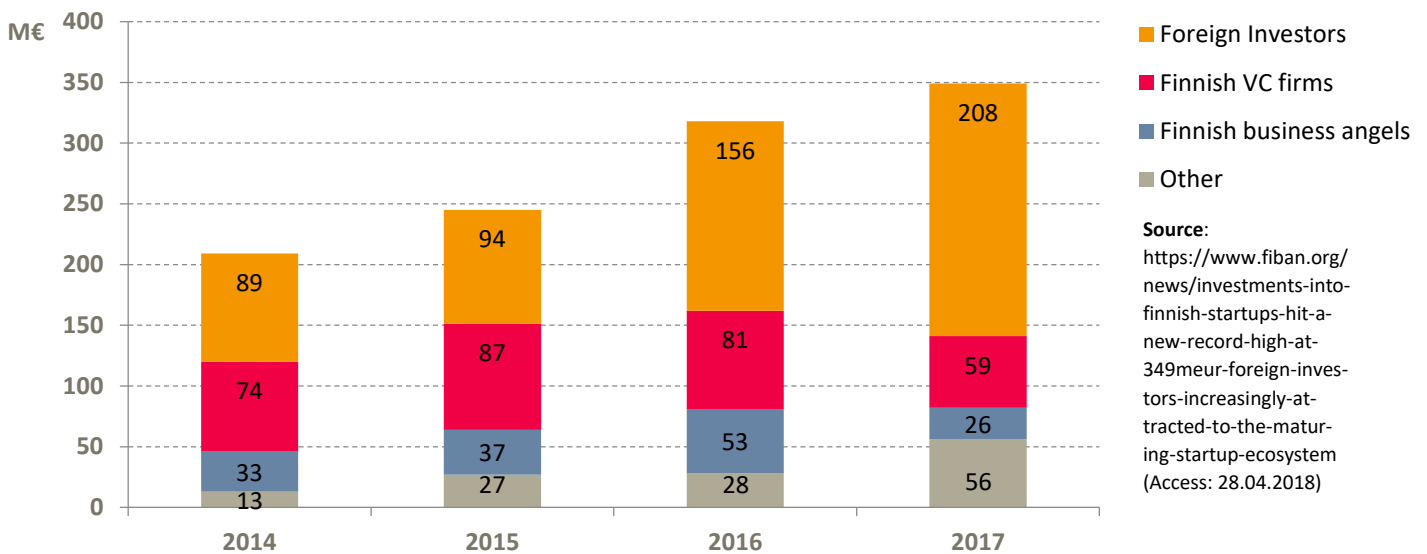
³⁷ Lehtovirta, H., Aloittavan Yrityksen Rahoitus (Financing of a Starting Enterprise), 2013

³⁸ <http://www.industryinvestment.com/about-us/key-figures> (28.04.2018)

³⁹ Lyytikäinen, I., Start-up yritysten rahoitus Suomessa, 2012, pp. 5-6

b) Further Statistics regarding start-up financing in Finland

Investments into Finnish start-ups and early stage growth companies



Statistics, collected by Finnish Business Angels Network (FiBAN) and Finnish Venture Capital Association (FVCA), show Finland blasting to another all-time high on investments made into Finnish start-ups and early stage growth companies in 2017. The total financing figure raised hit 349 million €.

The most significant change occurred in the number of foreign investors setting their sights on the region, as foreign investments surged to 208M€, resulting in a yearly increase of 33%.

The trend of foreign investors actively investing in Finnish start-ups and early-stage growth companies continued developing positively, as Finnish companies were able to attract a fresh record-high figure of 208M€ in foreign financing. The region's development on this front is significant, as the number of foreign investments has increased tenfold since 2010.⁴⁰

Regional angel activity

Most of the angel activity in Finland is based in the greater Helsinki region (71%) but more local activity is to be seen especially in Tampere, Turku and Oulu. It is important to have visible local angels, as it supports and inspires the "home town" start-up activity and gives better access to local investments. Also, the ending of Finnvera's (Finnish public investment institution) early-stage investment, has increased the importance of active local angel activity.⁴¹



⁴⁰ <https://www.fiban.org/news/investments-into-finnish-startups-hit-a-new-record-high-at-349meur-foreign-investors-increasingly-attracted-to-the-maturing-startup-ecosystem> (28.04.2018)

⁴¹ <https://www.fiban.org/news/finnish-business-angel-investments-2016> (28.04.2018)

Finnish Venture Capital Investments

	2012	2013	2014	2015	2016
Total angel investments (€)	24M	24M	33M	37M	53M
Amount of start-up with Angel investments	100	200	238	322	324
Average Investment per angel (€)	60,000	49,000	68,000	54,200	72,600
Median investment per angel (€)	30,000	25,000	25,000	20,000	20,000

M: Million Source: <https://www.fiban.org/news/finnish-business-angel-investments-2016> (28.04.2018)

- Increasing demand for Finnish venture capital expertise. In addition to the 80 million € invested in Finnish companies the Finnish VCs also invested 40 million € to foreign companies. Investments in foreign companies tripled from 2015.
- Seed stage investments almost quadrupled in five years. Finnish companies in seed stage received 14 million € in venture capital investments.
- Finnish venture capital investors co-invested in more than half of international funding rounds in Finnish companies. The co-investment rounds between Finnish and foreign investors totaled to 163 million € in Finnish companies. Finnish VCs share of the investment amount was 44 million€.
- Finnish venture capital-funds raised 114 million € of new capital. The new funds raised will be invested in early stage companies in the next years. Investors in fund include for example pension funds, public sector funds, family offices, corporations, insurance companies and private individuals.

2.6. Promotion and Support

2.6.1. Bavaria

▪ Technical University of Munich

The Technical University of Munich (TUM) provides different advising opportunities for scientists, researchers and students who want to start a business based on innovative ideas. There are several workshops, mentoring options and networking events like Entrepreneur's Night organized by the university. In 2015 they also established their own TUM Start-up Incubator which offers start-ups free coaching, consulting, networking possibilities and coworking spaces.



Source: <https://www.unternehmertum.de/makerspace.xhtml?lang=en>

Together with their Center for Innovation and Business Creation, UnternehmerTUM GmbH, they provide a huge variety of advising services that helps people develop their business plan and provides support at every stage of the start-up process as well as informative seminars and lectures with practical experts. One unique offering UnternehmerTUM GmbH provides for start-ups is their MakerSpace, which is a 1500-square-metre high-tech lab open to the national

and international innovation and entrepreneurial scene. It offers a place where members get access to 80 special machines, tools and software as well as a meeting place for a vibrant community.⁴²

▪ Social Entrepreneurship Academy

The Social Entrepreneurship Academy was founded as a joint initiative by the four university-based entrepreneurship centres in Munich in 2010. It was established to offer education possibilities with the aim of social changes. The SEA basically provides trainings, motivation seminars and education with a focus on entrepreneurial thinking for social entrepreneurs or social change makers under the slogan "Education for societal change". The main areas in which they provide support are Education and Integration, Society and Participation, Health Care and Social Challenges, Environment and Sustainability, Entrepreneurship and Innovation.⁴³

▪ University of Augsburg and University of Applied Sciences Augsburg

The University of Augsburg provides, together with Centre of Entrepreneurship, different possibilities for consulting, mentoring and networking. ACE is the central point of contact for start-up interested parties at the University of Augsburg and bundles all event, teaching and support offers around the topic of start-ups.

The aim is to make students and scientists aware of the business start-up as a career path and enthusiasm aroused, especially through lectures of successful founders from universities or the region.⁴⁴

Together with the University of Applied Sciences Augsburg they organize the yearly networking event "Augsburg gründet!". It offers the opportunity to network, pick up new ideas, find out about the founding and start-up activities of the region and talk to representatives of the sectors science, industry and politics.⁴⁵

▪ GROW4DIGITAL

With a total volume of up to 8.4 million €, the Bavarian Ministry of Science will in future support entrepreneurship education at the universities in Bavaria. The aim is to offer new courses of studies in the branch of start-ups with digital focus, combined with the mediation of entrepreneurial skills. The cooperative project includes a certificate study program, which can be completed during studies and extra-occupational, a Master degree program called "Digital Entrepreneurship" and also a Digital Innovation Business Lab, in which students and university members can advance their very concrete start-up projects.⁴⁶ These study and incubation offers are offered jointly by the participating universities and across locations. Entrepreneurship education is promoted within the scope of the Digitalisierung.Bayern (ZD.B) Center and is initially scheduled for three years.⁴⁷

▪ Zentrum Digitalisierung Bayern

The Center Digitalisierung.Bayern (ZD.B) is a Germany-wide unique research, cooperation and start-up platform, which acts as a catalyst in cooperation with industry, science, associations and public policies. The "Entrepreneurship Education at Universities with a Focus on Digitization" funding within the framework of the ZD.B serves to promote and strengthen entrepreneurship education, with a focus on digitization at universities in Bavaria. As a result, IT founders and creative providers of ideas for IT companies are to be motivated early on at the universities and equipped with specialist as well as entrepreneurial knowledge. At present, eight concepts promoting entrepreneurship education with a focus on digitization at universities in Bavaria are being funded by the Bavarian State Ministry of Education and Culture (StMBW).

⁴² <https://www.unternehmertum.de/makerspace.xhtml?lang=en> (28.04.2018)

⁴³ http://www.seakademie.de/getattachment/presse/SEA_Flyer-englisch_Online-Version.pdf.aspx (28.04.2018)

⁴⁴ <https://www.informatik.uni-augsburg.de/service/entrepreneurship/> (28.04.2018)

⁴⁵ <https://2018.augsburg-gruendet.de/> (28.04.2018)

⁴⁶ https://www.digitale-oberpfalz.de/news-termine/news/145_millionen_euro_fuer_neue_studienangebote_im_bereich_entrepreneurship.html?no_cache=1&cHash=801ff9fab541310acb11f189a4e7c7a3 (07.05.2018)

⁴⁷ https://www.oth-regensburg.de/fileadmin/media/presse/pdf/2018/Spektrum-2017-2_final.pdf (07.05.2018)

Entrepreneurship training is offered at the following locations in Bavaria:

- Akademie der Bildenden Künste Nürnberg
- FAU Erlangen-Nürnberg
- HAW Augsburg
- HAW München
- OTH Amberg-Weiden
- OTH Regensburg
- TH Deggendorf
- TH Ingolstadt
- Universität Bayreuth
- Universität Passau
- Universität Regensburg

The Center Digitalisierung.Bayern coordinates a large number of measures in the office: 10 innovation laboratories for students, 7 theme platforms, 11 entrepreneurship trainings and 20 professorships at universities.

▪ Planned new Bachelor and Master courses in Bavaria

The outstanding scientific and research landscape in Bavaria will be further enhanced and strengthened in future fields of digitization. For this purpose, 20 additional professorships will be created and networked throughout Bavaria: Research and teaching in the field of digital topics will be expanded and intensified. The 20 additional ZD.B professorships are currently being set up:⁴⁸

1	Universität Augsburg	Embedded Intelligence for Health Care and Wellbeing
2	Universität Bamberg	Privacy and Security
3	Universität Bayreuth	Serious Games/Applied Games
4	Universität Erlangen-Nürnberg	Digital Health
5	Universität Erlangen-Nürnberg	Digital Industrial Service Systems
6	LMU München	Human-Centered Ubiquitous Media
7	Universität Passau	Europäisches und Internationales Informations- und Datenrecht
8	TU München	Intelligente Wissensextraktion in der Medizin
9	TU München	Cyber-Physical Systems in Production Engineering
10	Universität Würzburg	Digital Media Processing
11	OTH Amberg-Weiden	Digitale Prozessketten i. d. medizinischen Versorgung & Medizintechnik
12	HAW Aschaffenburg	Kooperative automatisierte Verkehrssysteme
13	HAW Augsburg	Physical Human-Machine Interfaces
14	HAW Coburg	Mensch-Maschine-Interaktion im Internet der Dinge

⁴⁸ <https://zentrum-digitalisierung.bayern/initiativen-fuer-die-wissenschaft/professuren/> (07.05.2018)

15	TH Deggendorf	Big Data Applications
16	TH Ingolstadt	Fahrzeugsicherheit und Car2x-Kommunikation
17	HAW Landshut	Intelligente Energienetze
18	TH Nürnberg	Softwareentwicklung für sichere und autonome Fahrzeugsysteme
19	OTH Regensburg	Sichere und zuverlässige dezentrale Systeme
20	HAW Würzburg-Schweinfurt	Sozioinformatik und gesellschaftliche Aspekte der Digitalisierung

As part of its activities, the ZD.B office supports the Gründerland.Bayern initiative, thus helping to optimize the ecosystem for business start-ups. In particular, the new incubators will be included in the digitization process, which will be set up in the governing districts in the coming years as part of the Bayern Digital strategy. In the field of digitization promising projects in the pre-start-up and start-up phase are to be brought to market, in order to significantly increase the number of digital start-ups and IT companies. In addition, the ZD.B office supports all promotional and support offers of the Initiative Gründerland.Bayern.⁴⁹

■ Gründerland Bayern

The aim of the Bavarian State Government is to make Bavaria the leader in business start-ups. That's why the initiative "Gründerland Bayern" was launched. Thus, the Free State is already developing a perspective for the jobs of tomorrow. There a lot of information about starting a business can be found. The services include:

- Accompanying the entire innovation process
- Networking, consulting and coaching
- Financing: Bavarian start-up teams and innovative technology companies have been accompanied by Bayern Kapital since 1995 as venture capitalists in the seed and start-up phase. As part of the start-up initiative "Gründerland Bayern", Bayern Kapital is continuing this commitment and expanding it further.

With the Growth Fund Bavaria, promising Bavarian start-ups are provided venture capital for their expansion. The fund has a volume of 100 million € and is managed by Bayern Kapital GmbH.⁵⁰



2.6.2. Finland:

■ Start-up High School

In 2017 a new High School model specializing in start-up culture was established. The founders of the idea are the same people who founded the start-up event Slush, HundrED and educational provider Ottava Academy. The reason to establish the Start-up High School was to evoke the interest of the students in entrepreneurship and to give them the opportunity of doing great innovative things in different sectors. Instead of lectures in



THINK CRITICALLY, SOLVE PROBLEMS,
BECOME A CHANGE-MAKER.

⁴⁹ <https://zentrum-digitalisierung.bayern/gruenderfoerderung/gruendungsfoerderung/> (07.05.2018)

⁵⁰ <https://www.stmwi.bayern.de/wirtschaft-standort/gruenderland-bayern/> (07.05.2018)

an actual physical building the teaching takes place either online or in different learning environments beyond the school gates.⁵¹

■ Aalto University

Aalto University has been one of the major springing boards for many start-up accelerators, including Start-up Sauna. The University also provides the Aalto Start-Up Center, an accelerator program which offers start-ups different services, business development opportunities and coaching, support for finding financial incubators or funding and a huge network of business experts. It is addressed to innovations in the fields of information and communications technology and creative business. All start-ups are welcome. Therefore, it is not necessary to be connected to the university. Aalto University also established a Master program in Entrepreneurship and Innovation.



■ University of Helsinki

Helsinki Think Company is an entrepreneurship start-up community that is run by University of Helsinki and the City of Helsinki. Their aim is to help people to recognize their skills and bring them into action to create something unique for our future world. Their shared goal is to create impact in society by combating world problems. Everyone can get involved; it is not limited to students. Helsinki Think Company provides different free coworking spaces, bootcamps, accelerator programs and support for developing business ideas and networking. Besides a big community of open-minded entrepreneurs, the organization offers a bright variety of specialized workshops, mentoring, courses and networking events.⁵²



■ VTT Ventures

Finland's state research institute VTT project, called VTT Ventures, connects science, economics and Finnish entrepreneurial mindset together to create outstanding new businesses. The key principle is not only to help entrepreneurs with monetary support, but strengthen the founder team, selecting the co-investors and forming the board of directors with complementary skills. To strengthen new ventures there are 3 ways. First to mature the idea and technology together with the researchers, coach the researchers about the investor viewpoint to ease further funding, and scout for additional professionals to join the project. With using their network, they also bring in external experts to share their insights. To put in a nutshell, they work closely together with the entrepreneurs and maintain a long-term perspective, helping to convert technology into business through our knowledge and network.⁵³

■ Helsinki Business Hub - Business Development Corporation of the Helsinki Capital

Helsinki Business Hub helps investors to invest in Helsinki and accelerating business growth in the area. They are especially focused on some topics like Health and CleanTech. They help founders and people who want to start a business

⁵¹ <https://hundred.org/en/media/opening-a-startup-high-school-in-finland> (28.04.2018)

⁵² <http://staging.helsinkibusinesshub.fi/startup-entrepreneur-help-is-close-in-the-helsinki-area/> (28.04.2018)

⁵³ <http://www.vttventures.fi/for-entrepreneurs/> (28.04.2018)

to get access to financing, access to deal flow, introductions to international investors and corporate & start-up collaboration.⁵⁴

▪ Invest in Finland - Finland's state investment promotion agency

Invest in Finland is the official investment promotion agency for Finland, which connects international businesses to the opportunities in Finland and helps them to succeed. There are a lot of relevant information on Finland as a business location for setting up a business, finding the right location or visas and work permits. Information about business opportunities in the sectors Cleantech, Health & Wellbeing can also be found at the agency.⁵⁵

▪ Nuoret Yrittäjät – Offshoot of the employers' association Yrittäjät for small companies

Nuoret Yrittäjät is an offshoot of the employers' association Yrittäjät for small companies that work with their parent organisation, the Federation of Finnish Enterprises (Suomen Yrittäjät). Partnership is possible either as an entrepreneur, or with a student membership. The membership of the Federation of Finnish Enterprises is meant for those who run their own company and no longer study. Here are the following benefits and services for young founders and student memberships:

- Legal counseling - get free legal counseling at our call center
- Training – improving entrepreneurial skills
- Entrepreneur media and communications
- Networking events⁵⁶

▪ Selected accelerator programs in Finland

Boost Turku	www.boostturku.com/startup-journey	"Start-up Journey 2016"- program of a student-oriented accelerator in Turku
NewCo Helsinki	www.newcohelsinki.fi/en	Initiative to counseling of start-ups, already before founding, co-working space
Nordic Innovation Accelerator	www.nordicinnovationaccelerator.com	Cleantech-accelerator program in co-operation with the Cleantech-cluster in Finnish Lahti
Summer of start-ups	www.summerofstartups.com	Accelerator of Aalto-University for 15 Start-ups
Startup Sauna	www.startupsauna.com	Technology-open-minded accelerator, with access to Silicon Valley

⁵⁴ <https://www.helsinkibusinesshub.fi/#services> (28.04.2018)

⁵⁵ <https://www.investinfinland.fi/> (28.04.2018)

⁵⁶ <https://www.nuoretyrittajat.fi/en/join> (28.04.2018)

Vigo Accelerators	www.vigo.fi/accelerators	Association of 10 accelerators under the brand "Vigo" of the Finnish Ministry of Economics
Vertical	www.vertical.vc	Main focus on health, wellness, Wearables, Smart Home

3. Reasons for start-ups in...

3.1. Bavaria/Germany

■ Internationalization

With 82.7% most start-ups are planning an internationalization of their company. First of all, other EU countries are considered, as it is easier to access these countries than non-EU countries. Thereby the start-ups claimed that the cultural and lingual differences are not considered as a problem.⁵⁷

■ Diversity

According to a study, almost every tenth founder of a start-up in Germany has its origin abroad. Of all new start-ups in 2017 4,7% are founded from EU citizens. 3.3% are founded from people from outside the EU.⁵⁸

Two third of the German start-ups are convinced, that Germany profits from immigration in order to grow and to be competitive in the international market. At the moment approximately 30% of the employees of start-ups are from abroad, which is above average compared to established companies.⁵⁹

■ Cooperation

A very strong force in the German economy is the middle class, which is also a good area to start in order to get in touch with established companies. As it is always better to build a relationship in person, middle class companies are often characterised by entrepreneurial personalities who are open to new ideas and make an access into the industry easier. 50% of start-ups in Germany are currently in a cooperation. The German middle class aims for inspiration, potential suppliers for technology. Start-ups on the other hand profit from the reputation of the established companies. It also offers the opportunity to access markets faster and easier.⁶⁰

■ Start-up Hubs

More than half of the start-ups are located in the six regions of Hamburg, Berlin, Hanover/Oldenburg, Rhine-Ruhr metropolitan area, Stuttgart/Karlsruhe and Munich. Concerning the German federal states, Bavaria is home to 13.4% of the German start-ups and ranks at place three behind North Rhine Westphalia (14.4%) and Berlin with 16%.⁶¹

⁵⁷ http://deutscherstartupmonitor.de/fileadmin/dsm/dsm-17/daten/dsm_2017.pdf (28.04.2018)

⁵⁸ <http://www.dw.com/de/studie-deutsche-startups-sind-zuversichtlich/a-40974591> (28.04.2018)

⁵⁹ <https://www.gruenderszene.de/allgemein/deutscher-startup-monitor-2016-kpmg-2015-1601> (28.04.2018)

⁶⁰ <https://www2.deloitte.com/content/dam/Deloitte/de/Documents/Mittelstand/Deloitte-Erfolgsfaktoren-Mittelstand-Kooperationen%20Start-ups2017.pdf> (03.05.2018)

⁶¹ http://deutscherstartupmonitor.de/fileadmin/dsm/dsm-17/daten/dsm_2017.pdf

■ Why Bavaria?

The start-up scene in Bavaria is not as big as in Berlin, which makes networking much easier and creates a sense of familiarity. This makes personal relations between start-ups and investors more effective. Furthermore, a high percentage of established corporations as well as many universities and highly educated employees can be found. Bavaria combines tradition with innovation.⁶² Besides the professional environment, one important factor that needs to be taken into account when thinking about the perfect location to start a business, is the quality of life. According to the Mercer study, Munich is the city with the highest quality of life in Germany and by the way it is only a four hour train ride away from Vienna, which is claimed to be the city with the highest quality of life all over the world.⁶³



3.2. Finland

■ Internationalization and Infrastructure

As Finland is member of the European Union, the access to other European countries is easier, especially in the Nordic countries. It also serves as a gateway between East and West with the fastest flight connections between Europe and Asia.⁶⁴ Also internally Finland is providing a great basis for a successful business. The most advanced 5G test network in the world was recently launched by Finland. An ultra-fast and cyber secure submarine cable connection connects Helsinki and Rostock with a new digital highway. This connection is planned to be extended to Russia and the rest of Asia. 38% of energy in Finland is produced by renewable sources, which is very reliable⁶⁵.

Furthermore, international companies have the opportunity to access the same benefits and grants of as Finnish companies. These components created a vibrant start-up scene for new solutions and technologies. The majority of Finns speak English, which makes international companies feel welcomed.⁶⁶

■ Workforce

Not only are Finns able to speak English fluently, in general they are very well educated. A study of OECD showed that graduates from Finland are the highest performing graduates in Europe⁶⁷. A combination of a very strong education and the fact that labour costs are comparably low, make businesses in Finland even more competitive⁶⁸.

■ Safe environment

In both ways, professional and private, Finland provides a safe and strong environment. According to the Economist, Finland is amongst the tenth best business environments globally⁶⁹. Besides of a good education system, Finland is also known for high living standards and a clean and secure environment, which is contributing to an overall well performance regarding well-being. It also provides transparency and equality by being one of the least corrupt countries in the world. Moreover, it also provides a stable political environment which makes business operations and long-

⁶² http://deutscherstartupmonitor.de/fileadmin/dsm/dsm-17/daten/dsm_2017.pdf

⁶³ <https://www.mercer.de/newsroom/quality-of-living-2018.html> (03.05.2018)

⁶⁴ <https://www.investinfinland.fi/between-east-and-west> (08.05.2018)

⁶⁵ <https://www.investinfinland.fi/reliable-infrastructure> (08.05.2018)

⁶⁶ <https://www.investinfinland.fi/business-environment> (08.05.2018)

⁶⁷ <http://www.oecd.org/education/skills-beyond-school/Benchmarking%20Report.pdf> (08.05.2018)

⁶⁸ <https://www.investinfinland.fi/competitive-workforce> (08.05.2018)

⁶⁹ http://www.iberglobal.com/files/business_climate_eiu.pdf (08.05.2017)

term planning more predictable. Privately, inhabitants can profit from a high level of health care and day care for children⁷⁰.

■ Finnish start-up scene

Finland is known as a country of innovation and R&D. Compared to other European countries, the Finnish R&D expenditures, as a percentage of GDP, is the highest. In the last ten years the number of people with doctorate degrees nearly doubled and with 3% of all employees who are working in the field of R&D, it ranks at the top of the world in this section. It is important to mention that the IPR protection is very strong, which means that the intellectual property in a joint project belongs to the company and not to a research institution or university in Finland. This country has also built up several science parks, business incubators and technology centres. It also focuses on a knowledge transfer between businesses and universities⁷¹.

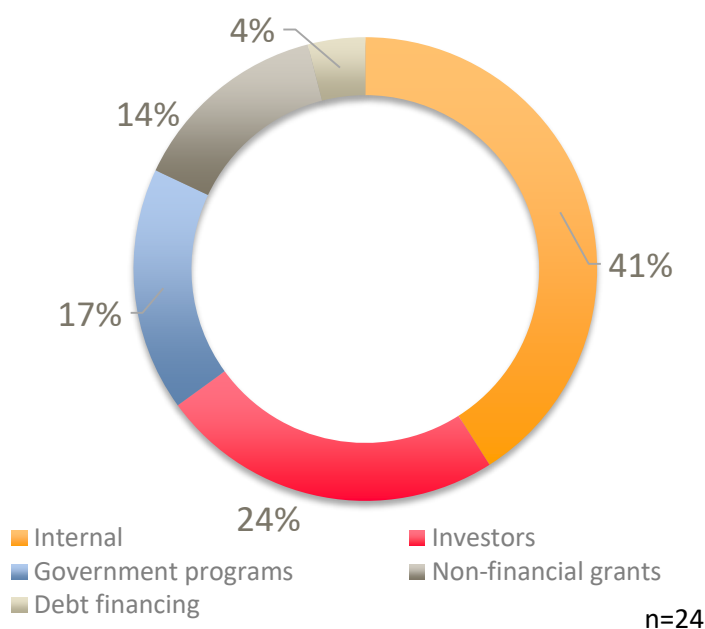
4. Project results

As part of the project, companies from the fields of automotive, life science and clean tech in Bavaria were surveyed. All of the young companies aren't older than 10 years and are still growing fast. The business ideas reached from online platforms for transportation and travel services and intelligent car sharing solutions in the automotive sector to reusable coffee mugs and plug n grow greenhouse solutions in the Clean-Tech sector up to a neuroscience app, pain therapy and medical translation in the field of Life Science.

4.1. General Results

4.1.1. Germany

■ Selected financing options



Internal financing:

Bootstrapping (own capital contribution, Family & Friends), Financing from company profits)

Financing through government programs:

EXIST, Innovationsgutschein Bayern, BayStartUp

Financing through investors:

Business Angles, Venture Capital, Convertible Loan Agreement

Other non-financial grants:

Coaching, Business Incubators (represent a financing effect since no expensive private consulting is required)

Financing through debt financing:

Bank loan, private loan

As shown in the pie chart the majority of surveyed start-ups are financed through internal financing measures, especially bootstrapping. In contrast, debt financing is the least used financing option with only 4 percent. The smaller proportion is not surprising; since founders have to overcome systematically higher hurdles in case of debt financing

⁷⁰ <https://www.investinfinland.fi/safe-playground> (08.05.2018)

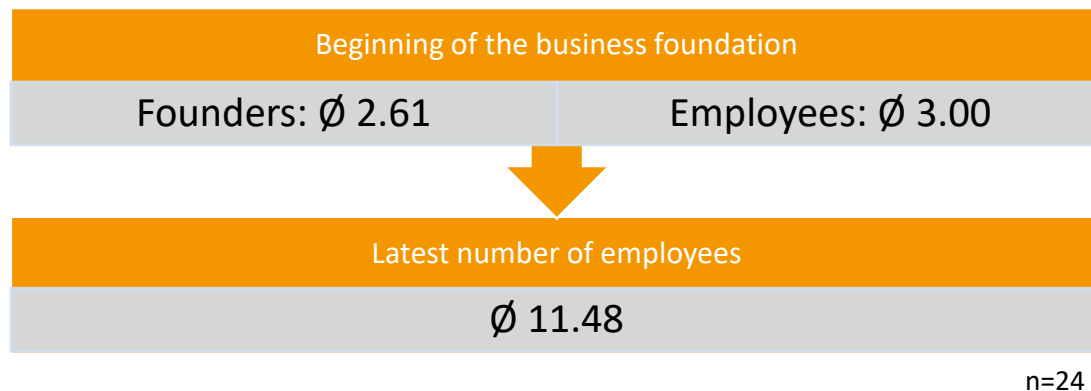
⁷¹ <https://www.investinfinland.fi/vibrant-startup-scene> (08.05.2018)

compared to already established companies. They often lack confidence-building elements such as entrepreneur's history or collaterals.

A quarter of the start-ups are financed with the help of investors. Especially support from Business Angles and venture capital providers are very popular in Bavaria. In addition to self-financing and investors every fifth start-up receives support through government programs like the often used EXIST founder scholarship.

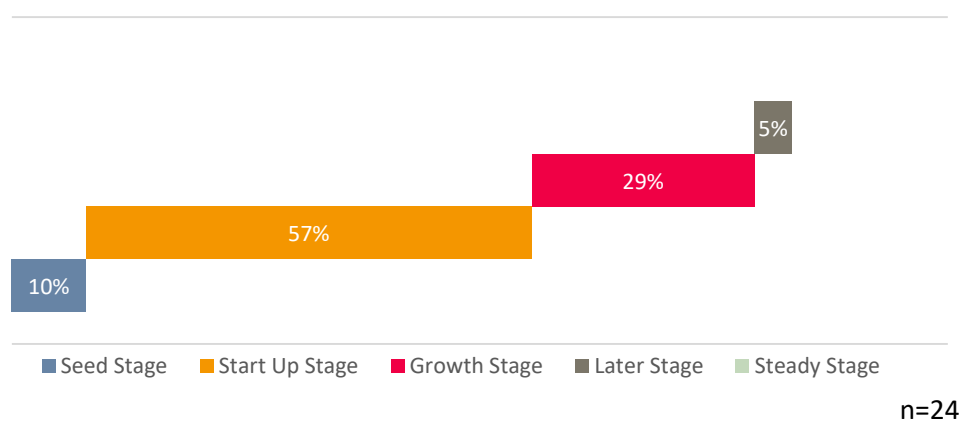
The mix is complemented by non-financial funding opportunities such as coaching and incubator programs

■ Number of Employees



The average number of employees has been quadrupled since the start of the business foundation. Our average result of 2 founders and 12 employees matches the European Start-up Monitor⁷². The largest growth of one of our start-ups has been a rise from 4 employees in the beginning up to 55 people working for them in 2018.

■ Start-up Stages



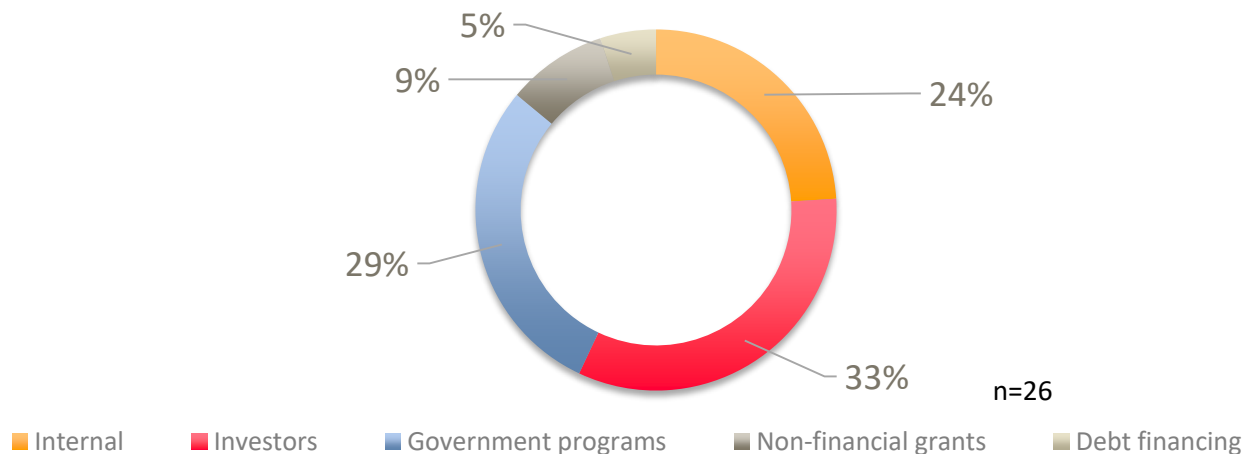
More than the half of the interviewed start-ups are currently in the Start Up Stage, so the first products and services are sold and based on the feedback of the customers the products are improved. Nearly every third start-up is already generating consistent sources of income and even if they are not yet in the Later Stage they are already thinking about expanding to other regions. Overall the start-ups are at the beginning of their business and are looking to establish their product on the market.

⁷² Kollmann/Stöckmann/Hensellek/Kensbock, European Start Up Monitor 2016, 2016



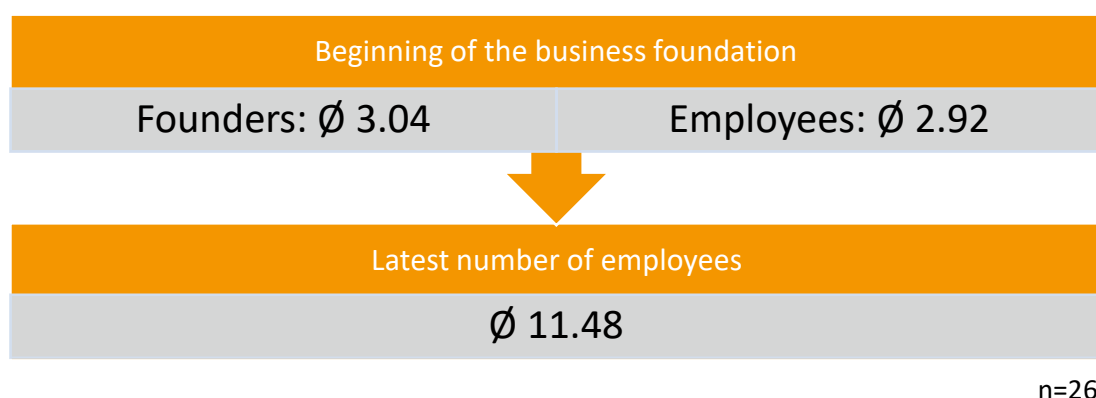
4.1.2. Finland

Selected financing options



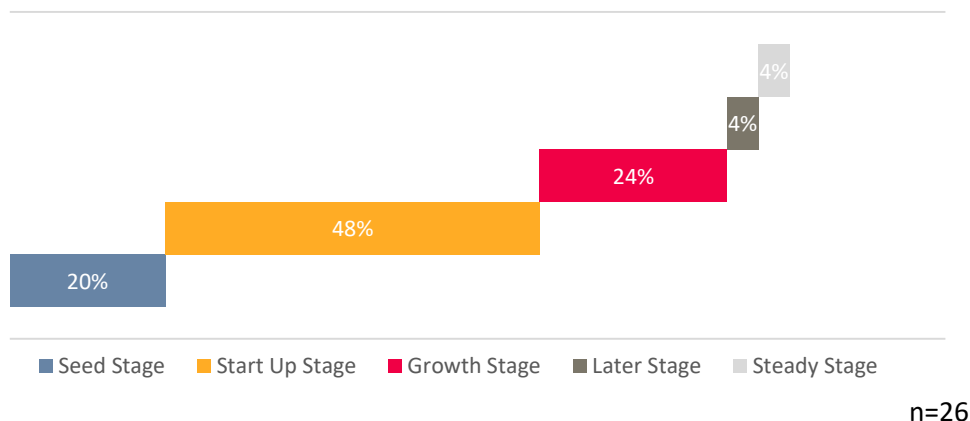
While the percentage of debt financing and non-financial grants is very close to the results of our German start-ups the internal financing methods are used half as much by the Finnish entrepreneurs. Only 24% are using their own money or the help of friends and family. Therefore using the help of investors and government programs is more common than in Germany. This could be a sign for a better infrastructure of business angles in Finland. Especially TEKES (p. 19) and Finnvera (p. 19) were mentioned both as public government programs for entrepreneurs. A lot of start-ups also mentioned investments of former NOKIA executives or an involvement as a co-founder.

Number of Employees



In average the interviewed start-ups were founded by 3 partners what matches the average of the whole Finnish start-up scene. Compared to the statistics of the European Start Up Monitor our interview partners had a slightly lower number of employees in the current state of their business. The growth of the Finnish and German companies over the last few years is comparable.

Start-up Stages



Like the German start-ups most of the Finnish companies are currently in the Start Up Stage while every 4th is one step ahead and already generating a consistent income. 4% of the interview partners even reached the Steady Stage which means they are now generating a stable profit and should now consider if they want to continue as up to now, push for further expansion or exit the business.

4.2. Automotive

4.2.1. Overview

Germany

Start-ups hardly had a chance in the automotive industry in Germany earlier. But the industry is in transition, innovative companies position themselves in the market. Some are working on concepts for a cheap electric car in the city to create an environmentally friendly alternative that customers can afford, others to network and digitize in the industry. Smart parking search, congestion forecasts, gasoline-saving coaches and the so-called connected car is on the rise. With new services carmakers and suppliers want to take care of their customers. The underlying innovative solutions for more comfort, safety and efficiency should cover the increasing needs of customers.⁷³

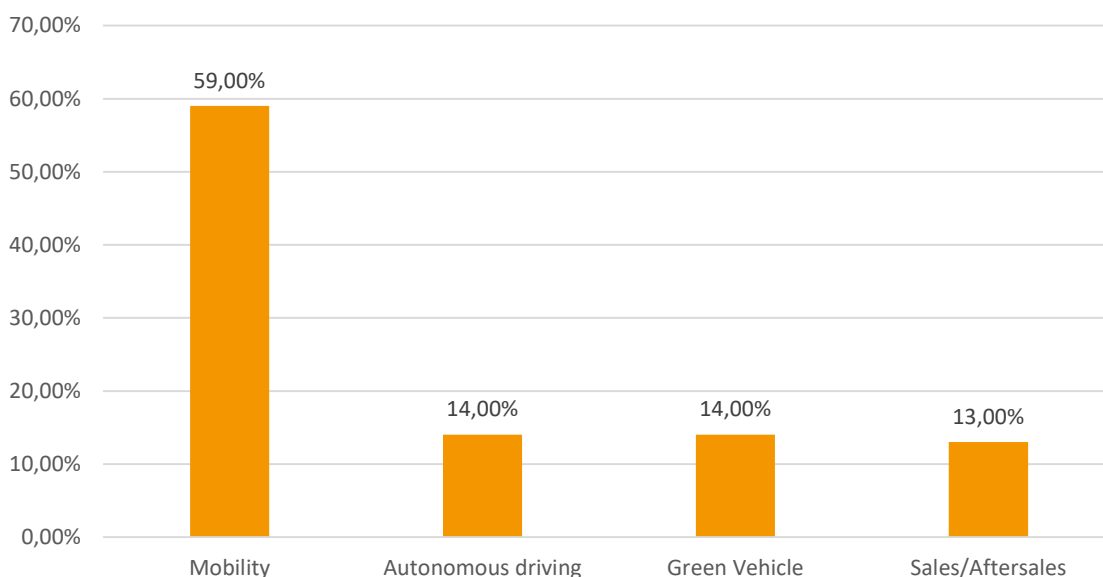
In addition, there is a slow but growing change in the industry regarding the current sales models of automobiles. As more and more customers assume a monthly budget logic and less of a full purchase price. Therefore, the start-ups are focusing on the development of more flexible systems such as car-sharing models or new leasing contracts. The leasing quote for new car sales is already at around 70 percent, and it will continue to increase as manufacturers' innovation cycles have accelerated and shoppers like to drive cars equipped with the latest technology. In addition, it is increasingly important for the customer to be flexible, to have the right vehicle for a specific purpose, or to have customized financing options. That is why many start-ups rely on the digitization of classic leasing contracts. Digitization in this area opens up new possibilities for the customer at the point of sale, e.g. availability of a clearer comparison of deals.^{74 75}

⁷³ <https://ngin-mobility.com/artikel/e-auto-startups-ueberblick/> (09.05.2018)

⁷⁴ <https://ngin-mobility.com/artikel/startups-auto-leasingmarkt-ueberblick/> (09.05.2018)

⁷⁵ <http://www.oliverwyman.de/media-center/2017/Erhoehter-finanzieller-Einsatz-fuer-Grunder.html> (09.05.2018)

Automotive start-ups in Germany from 2011 to 2016



Source: <https://de.statista.com/statistik/daten/studie/758946/umfrage/verteilung-der-automobil-start-ups-in-deutschland-nach-geschaeftssegment/>

From 2011 to the first half-year of 2016, the newly founded start-ups in the automotive sector have been divided into four areas. The two sectors mobility services and networked and autonomous vehicles together account for around 73%. It is clear that the start-ups of the automotive industry in Germany are very focused on the development of new software solutions.



Finland

Finland has an internationally unique opportunity to use an information-based test area for intelligent vehicle and mobility solutions with the Aurora-Touch ecosystem in Finnish Lapland. Various initiatives are tested here, e.g. intelligent transport systems. In addition, Finland has created the world's first Mobility as a Service (MaaS) traffic ecosystem, now also tested in the United Kingdom. ⁷⁶ Due to these unique conditions, start-ups in this field have an excellent chance of developing in Finland.

From a macroeconomic point of view, the automotive industry in Finland plays a minor role compared to Germany. According to the Finnish Statistical Office in 2013, about 285 companies with 6,190 employees were registered in the automotive industry. While in Germany about 21% of the turnover in the manufacturing industry comes from the automotive industry, the Finnish share is at a low level of 1.1%. ⁷⁷

⁷⁶ [http://techhubfinland.fi/finland-surprises-with-wide-range-of-intelligent-vehicle-and-mobility-solutions-first-maas-solution-testing-starts-in-the-uk/#\(09.05.2018\)](http://techhubfinland.fi/finland-surprises-with-wide-range-of-intelligent-vehicle-and-mobility-solutions-first-maas-solution-testing-starts-in-the-uk/#(09.05.2018))

⁷⁷ [http://www.gtai.de/GTAI/Navigation/DE/Trade/Maerkte/Branchen/Branchen-kompakt/branche-kompakt-kfz-industrie-und-kfz-teile,t=branche-kompakt--kfzindustrie-und-kfzteile--finnland-2015,did=1283448.html\(09.05.2018\)](http://www.gtai.de/GTAI/Navigation/DE/Trade/Maerkte/Branchen/Branchen-kompakt/branche-kompakt-kfz-industrie-und-kfz-teile,t=branche-kompakt--kfzindustrie-und-kfzteile--finnland-2015,did=1283448.html(09.05.2018))

The number of vehicles purchased in Finland is increasing, although alternative drive technologies are still not very popular. In 2014, only 203 fully electric and 263 hybrid (semi-electric) vehicles were registered, accounting for less than 1% of all new registrations. The development of electronic vehicles could be a gap in the market for start-ups.⁷⁸

4.2.2. Specific support programs

■ Germany

As the country of automobility, there are some industry-specific sponsors in Germany. Here are a few of them:

Startup Autobahn

Startup Autobahn is an open innovation and cooperation platform launched by Daimler in May 2016 between established companies and start-ups in the fields of mobility and industry 4.0. Founding members of the initiative are the Daimler AG and its US partner Plug & Play Tech Center, the University of Stuttgart and the Forschungsfabrik Arena 2036. According to Daimler, the aim of the project is to transform the region Stuttgart into an innovation hub for mobility and Industry 4.0 and an attractive start-up ecosystem. With four new partners, namely BASF, Hewlett Packard, Porsche Digital and ZF Friedrichshafen, four other global corporations are among the sponsors.⁷⁹

www.startup-autobahn.com

Digital Hub Mobility

The concrete development of digital products, with a focus on flexible and networked mobility, is the goal of Mobility Hub Munich. It is part of the nationwide “de:hub” initiative of Germany. In addition to the successfully established Digital Product School, an experimental and test environment for urban mobility concepts is to be developed. The joint development of new business models for networked and automated driving is also planned. The company is sponsored by UnternehmerTUM GmbH with the support of the Center for Digitalization Bavaria. Partners include the following: Audi, BMW Group, Daimler, IBM, Nokia, SAP, Stadtwerke München, ADAC, Infidas, Infineon, MAN, TÜV Süd and Facebook.⁸⁰

<https://www.de-hub.de/die-hubs/muenchen/>

Bayern Innovativ - Bavarian Society for Innovation and Knowledge Transfer mbH

The Management Cluster Automotive provides targeted information about funding programs and financing opportunities for research and development as well as cooperation projects. Also it supports the development of partnerships and cooperations. For the consortium formation and the selection of funding programs, the cluster works closely with the partners of the Bavarian Research and Innovation Agency (BayFIA). Intensive networking in the automotive cluster is achieved primarily through cluster-specific cooperation platforms, such as cluster meetings and cluster forums. The process of initiating and supporting value-adding projects is supported by a broad country-wide network of partners consisting of numerous institutions such as IHKs, business offices, regional clusters and multipliers.⁸¹

<https://www.bayern-innovativ.de/>

⁷⁸ <https://www.gtai.de/GTAI/Navigation/DE/Trade/Maerkte/Trends/StartUps/Land-Finnland/trend-land-finnland.html> (09.05.2018)

⁷⁹ <https://www.automobil-industrie.vogel.de/startup-autobahn-weg-fuer-junge-unternehmer-a-584433/> (07.05.2018)

⁸⁰ <https://www.de-hub.de/die-hubs/muenchen/> (07.05.2018)

⁸¹ <http://www.bayern-innovativ.de/ca/foerderung> (07.05.2018)

To find the right **business angel** for various options can be used:

BayStartUp

With around 200 listed business angels and around 100 institutional investors, the Bavarian financing network is one of the largest in Germany. Private investors and family offices from Bavaria are active in this, as are venture capital companies, public investors, strategic investors and the funds of large companies. Every year, the Bavarian financing network already provides between 20 and 30 million € of capital to around 25 companies in the seed and growth phase.⁸²

<https://www.baystartup.de/>

Go Beyond Early Stage Investing

Go Beyond's vision is to make Angel Investments an asset class for angelic beginners and experienced business angels, for smaller or larger investment tickets. They offer a unique deal platform, portfolio tools, the possibility of joint investments as syndicate, due diligence, monitoring, training and experienced, certified deal leaders. There are active business angel groups from Go Beyond at 10 locations in Europe and the US.⁸³

<https://go-beyond.biz/>



■ Finland

Anyone looking to start a business in Finland with a new idea can count on extensive support from business angels and the government. The country has in recent years developed a strong start-up scene that attracts many company founders and is financially well equipped in recent years. The "The State of European Tech" study has found out that the largest business angel density is in Helsinki, ahead of all other European cities. Finland, with Helsinki as its focal point, is a highly active research location.⁸⁴

There are many different support programs that a young company can use, but there are hardly any industry-specific programs or organizations that only support and promote the particular industry of automotive. A start-up that falls into this industry sector can use all existing and acting accelerators in Finland. Below we briefly introduce one of the largest funding agencies.

Tekes – the Finnish Funding Agency for Technology and Innovation

Tekes is the main publicly funded organization for financing research, development and innovation in Finland. It promotes far-reaching innovation activities in research communities, industry and services. They work together with the most innovative companies and research institutions in Finland. Talking about promoting international cooperation on research and development, Tekes promotes collaborative research and development projects and facilitates researchers' mobility. Funding for research, development and innovation targets projects that provide the greatest benefits to the economy and society. Tekes is headquartered in Helsinki with offices in six locations abroad.⁸⁵

<https://www.businessfinland.fi/>

⁸² <http://www.business-angels.de/mitglieder/mitgliederverzeichnis/> (09.05.2018)

⁸³ <http://www.business-angels.de/mitglieder/mitgliederverzeichnis/> (09.05.2018)

⁸⁴ <https://www.gtai.de/GTAI/Navigation/DE/Trade/Maerkte/Trends/StartUps/Land-Finnland/trend-land-finnland.html> (09.05.2018)

⁸⁵ <http://www.finland.org/public/default.aspx?nodeid=44642> (09.05.2018)

4.2.3. Insights

▪ Business models

The following topics play an important role in the business models in the automotive industry and are therefore very diverse: e-mobility, sharing services, software solutions with apps, "Uber for things" or platforms, one that combines the car pool of used cars with financing products from various banks or another that brings buyers and sellers together of used wheels, tires and rims. The majority of surveyed companies have a clear focus on B2C business models, but there are also some that act on a B2B level. In addition, there are start-ups who act as intermediaries in the market and are therefore oriented towards C2C.

▪ Current market conditions

The topics of sharing and e-mobility are becoming increasingly important. The reputation of the industry is unfortunately often negatively charged. It is important to be flexible as a start-up and to be open not only for new business models but also for entering into cooperations. Due to many new technologies, the market is currently in transition and offers great potential for founders. Digitization also opens up further possibilities.

▪ Competition

There are already some competitors, but not many have yet established and developed well. As far as the focus on digital business models is concerned, the market is already highly competitive. However, in terms of sharing services, competition is still low. In general, it can be summarized that the market is currently revolutionizing and bringing new ideas.

▪ Industry issues & challenges

As a start-up the usual challenges has to be faced. The biggest challenge is building a reputation to become a company with a big name. The implementation of this is capital-intensive and it must be circumvented processes and proven innovation. In addition to the high market segmentation in the industry, there is a competition with existing established technologies that are cheaper.

▪ Entry barriers

Starting a business in the automotive sector is not an all-too-difficult undertaking, as there are no specific industry-specific barriers to entry. The industry is broad-based and is considered to be less standardized because it ranges from software solutions with apps for B2B to sharing offers for private customers. Long development cycles can make it more difficult for new players in the market. A start-up must be well considered. A lot of money must be spent by the founders themselves or sponsors have to be found to cover the costs. For this a good network of contacts is helpful.

4.2.4. Outlook

One of the most important long-term goal for start-ups in the automotive industry is the development of long-term (domestic and foreign) partnerships and successful, scalable products. The automotive start-ups are primary focused on cooperation's with foreign banks and investors but also with agencies and international logistics services providers.

The main focus is on establishing its business on the German-speaking market, through expansion of their product range or general growth. Once this goal is achieved the start-ups expect a huge potential in the international markets.

Internationalization plays an enormous role for most companies in the longer term. It promises to gain access to new markets, capital growth and new production opportunities. In addition, the development of key competences and joint risk management seem very lucrative. Networking between companies leads to knowledge transfer and cooperation in research and development

4.3. Life Science

4.3.1. Overview

What is Life Science?

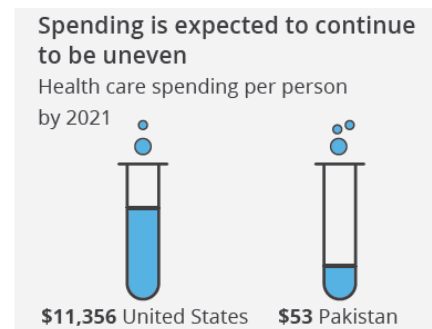
Generally all sciences that have to do with organisms as animals, plants and human beings are life sciences. Companies are class-divided into the domains of⁸⁶

- biotechnology
- agro technology
- animal science
- bio-Engineering
- bioinformatics
- biology
- biomedical engineering
- biomedical systems
- biophysics
- cell biology
- environmental sciences
- food sciences
- neuroscience
- molecular biology
- genetics
- plant science
- biomaterials
- biomedical imaging

Why are outgoings in the health care sector increasing?

An important and obvious reason is the aging and increasing population. People all over the world are expected to live longer than people some decades ago. So there is a lot of old people with typical diseases of older generations.

Due to globalisation there also is a new market expansion. Moreover advances in medical treatments must be financed somehow and rising labour costs has to be faced.⁸⁷



Source: Article Global Life Sciences Outlook 2018

Challenges resulting from changes in technology

Because of the advances in medical systems information will be easier to use in the future. Companies must be prepared that dealing with **big data** will be a big issue. The keyword here is **digitization** and realizing its importance. New technologies are compatible with fast moving life styles and companies have to adopt and to use these created possibilities if they want to survive on the market.⁸⁸

Internet security and health care

Regulations have already been an important topic when it comes to set up a company. But it will become even more important because the life science sector is expected to be proactive instead of just reacting to problems or defending them. There must be a proactive cybersecurity to protect patient data and care, intellectual property, reputation, shareholder value, organizational assets and relationships to customers.⁸⁹

⁸⁶ Deloitte 2018 Global Life Sciences Outlook; infographics

⁸⁷ Deloitte 2018 Global Life Sciences Outlook; infographics

⁸⁸ Deloitte 2018 Global Life Sciences Outlook; infographics

⁸⁹ Deloitte 2018 Global Life Sciences Outlook; infographics

4.3.2. Specific support programs

■ Germany

Medical Valley



Location: Nuremberg/Erlangen

Together with ZOLLHOF Tech Incubator the Medical Valley is the official digital hub for Germany. They provide a wide range of services like subsidy acquisition and consulting, identification and procurement of clinical partners, strategic requirement analysis and international market access. They are located near the University of Erlangen which is very well known for its research in the medical sector.

The start-ups in the Medical Valley focusing on:

- Innovative diagnostic and therapeutic procedures
- Solutions for independent living at home – even in old age
- Solutions for health promotion and prevention
- Approaches to ensure the financial sustainability of healthcare systems
- Development of P4 medicine (preventive, predictive, participatory, personalized)

<http://en.medical-valley-emn.de/>

BioM



Location: Munich

Since 1997, BioM is the network organization of the biotechnology sector in Munich and in Bavaria, commissioned by the Bavarian Ministry of Economic Affairs. Approximately 270 biotechnological and pharmaceutical companies are present in the metropolitan area of Munich. The core competence of the region is the development of innovative therapeutics and diagnostics, in particular for personalized healthcare. BioM supports the Bavarian biotechnological and pharmaceutical sector with an extensive network for developing new business contacts. The cluster management offers central access and a broad range of information about the sector for prospective customers from home and abroad.⁹⁰

<https://www.bio-m.org/en.html>



■ Finland

Health Capital Helsinki



Location: Helsinki

“Health Capital Helsinki is an alliance formed in 2015 by the City of Helsinki, the University of Helsinki, Aalto University and HUS – Helsinki University Hospital. Health Capital Helsinki develops Finland and the Helsinki region into the best Northern European hub for life science- and healthtech-based innovations and business development. HCH facilitates the

⁹⁰ <https://www.bio-m.org/en/about-biom/profile-vision-and-mission.html> (07.06.2018)

commercialization of scientific research, increases the number of business ideas, start-up companies and jobs, as well as supports business growth and accelerates export.”⁹¹

<https://www.healthcapitalhelsinki.fi/en/>

Terkko Health Hub



Location: Helsinki

“Terkko Health Hub is an event space, co-working area and a start-up community focusing on health and life sciences.”⁹² They provide contacts to the biggest University hospitals in Europe and are located on the campus of HUS (the Hospital District of Helsinki). Their build-

ing houses idea accelerators, start-ups, the Meilahti Campus Library, an office and event space available for rent.⁹³

<http://terkko.fi/>

4.3.3. Insights

■ Germany

Most of the interviewed start-ups are operating in the B2B sector. Hereby they often offer Software solutions in order to make processes more efficient. Also they are often app-based and generate turnover through license contracts. However it is important to mention that in the field of Life Science and especially Health Care the end user isn't the business, which would mean in our cases hospitals, nursing cares and rehabilitation centers, but more than that the patient. He or she is the profiting from the innovations the Life Science sector is developing.

The interviewed start-ups stated clearly that the global processes of digitization is also taking place in the sector of Life Science and Health Care. Compared to other industries however this process is moving very slowly. Moreover Germany is lacking a big number of nursing staff, which makes everyday life in this field difficult for the employees and the management. The combination of those two problems are creating also great potential for start-ups, as they are the ones bringing innovations closer to this field.

Through those growing perspectives, the competition is also rising in this field. It offers the perfect environment for innovative and special products and services. When it comes to competition it has to be differentiated between two ways an entrepreneur can choose. First of all, there are high regulations in the market, which are needed to keep the current medical level high. In order to meet the requirements of the legislation and the regulations an entrepreneur has to go through clinical studies and several approvals of the service or product. Once the company got the approval and the validation they gain a competitive advantage in the market and are less surrounded by competitors. This choice is often made by entrepreneur who have a scientific background or doctors, who are being paid for their research and don't feel the pressure to gain money in a short period of time. However, this consumes a lot of time and money, which is why many entrepreneurs choose to avoid these regulations by creating e.g. a lifestyle app which doesn't need to reach medical regulations. In this area there are a lot more competitors, but it's possible to generate turnovers faster, as it's allowed to entry the market sooner than in the first option.

Although the need for digitization is definitely given, the process is only moving slowly. Especially the Health Care sector is very conservative, which makes the market entry harder. Many of the interviewed start-ups also pointed out that it's hard to gain full knowledge of the German Health Care system and to know which requirements need to be met. It is a rather closed market. Mostly only hospitals, doctors, scientist and health insurances interact in this field. The access to this market can be successful through these groups, as they are the ones directly getting in touch with the patients.

⁹¹ <https://www.healthcapitalhelsinki.fi/en/about/> (07.06.2018)

⁹² <http://terkko.fi/> (07.06.2018)

⁹³ <https://www.helsinki.fi/en/news/health/terkko-health-hub-builds-bridges-between-research-and-business> (07.06.2018)

A general problem is the high discrepancy between the high innovative start-ups, who need a lot of testing in order to develop their products and services and the risk-free Life Science sector. It is hard for our start-ups to be highly innovative and meeting the needs of the market but being fully understood at the same time by the ones who would have to introduce their products and services to the market.



■ Finland

Similar to the German start-up market a majority of the interviewed companies are operating in the B2B sector. Software as a service is a popular business model as well, however it was also shown that Finnish start-ups are developing a lot of innovations in the field of medical technology.

The interviewed firms see the current market situation optimistically, as the population is getting older and new technologies and solutions are needed. However they also emphasized the conservative industry and try to establish their ideas. Many of them got their business ideas in a different industry and complain about the slow digital developments in the Life Science sector compared to other areas. On the other hand they are aware of the fact that things are changing and this creates huge opportunities. A few pointed out that the capital for Life Science issues is rising although the quality of the goods and services is not yet as high as it will be in some years. It was also stated that the slow progress is positive in order to be first-mover in the market, because the business is able to grow with the market and all of its changes. All in all the awareness and acceptance for new technologies is rising and it is a good market to establish ideas that make life easier and healthier.

When it comes to competition in the Finnish Life Science sector many start-ups stated that they have no or just a few direct competitors, as they are often operating in different and specialised directions. However it has also been made clear that in general there is a huge competition in the market due to the great potential in the market.

Nevertheless, a lot of start-ups are struggling to get access to hospitals and patient data in order to get their product or service to the next level. It was often stated that this sector is a no-risk-sector. In order to develop and improve ideas failure is inevitable. Hospitals are rather getting into cooperation with big companies as they also tend to aim for less risk than an innovation driven start-up does. Many companies also see the small population of Finland as a problem, because they find it hard to find special educated employees and the market is too small to generate enough turnover. As a result, a lot of them are focused on establishing their business abroad where they have to cope with a lot of different health care systems. Of all interviewed start-ups, many also stressed out that the market entry is not as easy as in other industries, especially because of the conservative mentality that was already mentioned before. As already seen in Germany, also the Finnish start-ups have to deal with high regulations that are clearly necessary but make a fast market entry very hard.

4.3.4. Outlook

■ Germany

The current situation in the market implies a lot of changes in the future.

As mentioned before, Germany is dealing with a great staff problem that is tried to be solved by start-ups through optimizing processes by analyzing them and making them more efficient. One more trend will be the personalization of the therapy. Through global digitization more people will be able to get access to qualified therapies, which will be expensive in the beginning, but will get cheaper later on. The internet of things will affect the Life Science sector as any other industry. With the help of eHealth a data exchange will be faster. Results and knowledge will be connected

through several institutions like hospitals and nursing cares. However not only the patient data has to be dealt with. All medical devices will generate digital data which will be connected in the network. The collected data has to be analysed and stored afterwards. This results in a need for data storage solutions and suitable and trustworthy software systems.

All of the interviewed companies told us that they definitely want to develop and improve their products and services. Furthermore many of them are already thinking of an expansion of their business which leaves little room to think about a possible exit.

Moreover they are intensively thinking about going abroad and many of them have already taken the first steps to build connections around the globe. A lot of German start-ups consider the DACH region as a good start to begin the business expansion. In the sector of Life Science UK, France and the US are very popular. Also Australia and Israel are seen as popular states in this industry and are developing into the future Hubs for the scene.

When it comes to cooperation it's considered as useful to distinguish between three different types of cooperation. First of all a cooperation with an established company in order to develop the product or service. There are mixed feelings about this type of collaboration because it is often feared that bigger companies can consume the little ones by buying them or taken their patents away. Secondly, there is also the option to cooperate with other companies as a supplier or solution provider. In this case the business model often rely on cooperation. It also helps the start-ups to improve the service or product by the feedback they gain from experienced players in the market. Thirdly, a lot of start-ups in the start-up scene are interested in getting an outside view on their offer and get together with other start-ups. This can take ideas to the next level because the other start-ups are often not from the same industry and use other approaches to deal with problems that the start-up wouldn't have considered in the first place. Moreover it helps a lot to be able to talk about insecurities and experiences with people who have been or are still in the same position as the start-up itself. No matter what kind of cooperation fits best to the company, all interviewed companies were sure that they can profit from collaborations by improving and developing their product.



▪ Finland

The interviewed Finnish start-ups see the most potential in Artificial Intelligence. Moreover they are sure that this will have the biggest impact on the future. In addition to that they see a future where e.g. eHealth is totally normal and accepted. Regarding these developments there will come a great responsibility of handling data efficiently and ethically correct. People will become more aware of their data rights and will need to have transparency in all processes. This again creates opportunities for the start-ups. Some start-ups also stated that the growing population and the higher expectancy of life will create the need to have other locations for treatments than only hospitals and nursing cares. In response to that there will be a huge pressure on the public health sector, but also opportunities to develop medical technologies that can e.g. monitor the wellbeing of a patient more easily from home.

A majority of the start-ups are intending to develop their product further in the future. One big goal is to act internationally. Like in Germany many of them have already taken the first steps and are already operating abroad. A striking difference between the two regions was that more Finnish companies have started their business operations in a different country, rather than starting in their home market. However, while the business is beginning to develop abroad, the administrative lead of the company is located in Finland.

Remarkable was also the degree of companies that are already in cooperation with other corporations, especially hospitals. As already mentioned before, many of the interviewed start-ups are working on medical technology innovations, which require medical patient data in order to correctly develop the products and services. Although it is hard to get into those cooperation, the market entry is much easier when the product is launched. Overall, the Finnish Life

Science market is taking AI more into consideration while developing innovation and are already operating more internationally than the German start-ups.

4.4. Clean Tech

4.4.1. Overview

▪ Germany

Clean Tech or clean technology, is often used interchangeably with the term greentech, has emerged as an umbrella term spanning the investment asset class, technology, and business sectors which include clean energy, environmental, sustainable or green, products and services.

Clean Tech represents a diverse range of products, services, and processes, all intended to:

- Provide superior performance at lower costs
- Greatly reducing or eliminating negative ecological impact
- Improving the productive and responsible use of natural resources

Clean Tech contains many industry verticals and is defined by the following eleven segments:

- | | |
|-------------------------|------------------------------------|
| ▪ Energy Generation | ▪ Air & Environment |
| ▪ Energy Storage | ▪ Advanced Materials |
| ▪ Energy Infrastructure | ▪ Manufacturing/Industrial |
| ▪ Energy Efficiency | ▪ Agriculture & Food |
| ▪ Transportation | ▪ Recycling & Waste. ⁹⁴ |
| ▪ Water & Wastewater | |

Germany, like the rest of the world, faces the consequences of global warming and the country has been one of the global leaders in battling carbon emissions. One effort involves to increase the efficiency of the use of resources. The German government has set a goal of trying to use fewer resources while maintaining the same amount of prosperity and according to a 2014 report, efficient use of raw materials in 2020 is expected to be double that of 1994. The country is currently embracing its Energiewende, or "energy turn," policy as it tries to position itself as a future provider of renewable energy technology to the rest of the world.⁹⁵ Therefore, in Germany a lot of change is going on e.g. the Federal Ministry for Economic Affairs and Energy promotes an energy export initiative that is mainly intended for small and medium-sized enterprises (SMEs) offering energy solutions in fields of renewable energy, energy efficiency, smart grids and storage technologies. The focus is also shifting to new technologies like power-to-gas and fuel cells. In the context of the initiative, the Federal Ministry for Economic Affairs and Energy wants to help companies enter new markets abroad with the aim to increasingly spread German energy technologies worldwide.⁹⁶

Germany remains the EU country with the largest installed wind power capacity and installed the most wind power capacity in 2017, with 42% of the total EU new installations and 19% of the installed capacity in Germany was offshore. So, it is the biggest Clean Tech industry.⁹⁷

⁹⁴ <http://www.cleantech.org/what-is-cleantech/> (09.05.2018)

⁹⁵ <https://www.azocleantech.com/article.aspx?ArticleID=549> (09.05.2018)

⁹⁶ <https://www.bmwi.de/Redaktion/EN/Artikel/Foreign-Trade/energy-export-initiative.html> (09.05.2018)

⁹⁷ <https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Statistics-2017.pdf> (09.05.2018)

Due to a lack of direct sunlight, the German climate in general is not suitable to the commercial operation of solar thermal power plants. However, German firms and research establishments are world leaders in this field of technology, so there is a lot of potential for exports. A large proportion of solar thermal power plants around the world use the key components developed in Germany.⁹⁸

In Bavaria the Clean Tech industry is present but at the same time capable of development. Innovations seem to be thwarted by dejection, public regulations and bureaucracy.⁹⁹ The wind conditions in Bavaria are not perfect for wind energy, thus the number of turbines in (mostly northern) Bavaria is 486, which ends up at rank 13 in relation to all 16 German states.¹⁰⁰

A partnership led by California-based “PowerLight” has constructed a 10MW photovoltaic facility in Bavaria, Germany. Billed as the world’s largest solar PV power plant, it cost €49.5m and opened in June 2005.¹⁰¹ On one hand, the Bavarian climate suits solar thermal power plants but on the other hand the market is served. Besides wind and solar energy, the Clean Tech industry is expandable in Bavaria. The market is definitely not a mature market.



Finland

The Clean Tech sector in Finland covers (like in Germany) processes, closed systems, products and services that promote sustainable use of natural sources and efficient productivity.¹⁰²

Energy-intensive industries, the cold climate and the lack of domestic fossil fuel resources have turned Finland into one of the global leaders in clean technologies. According to the *Global Cleantech Innovation Index 2017* Finland ranks second, five positions ahead of Germany. About 40% of Finnish power is already produced with renewable energy such as hydro, biomass, solar and wind power. Especially wind power is a really promising and relatively new mode of electricity generation in Finland. The country is predestinated for this energy source because even during the winter months the wind conditions are strong. By 2030, Finland will increase its share of renewable energy to 50% and coal will no longer be used in energy consumption. So can be in general said that the environmental awareness has drastically risen in the past two years. One reason for that is that Finland is a member of the Paris Agreement, signed in 2016. With regard to the agreement, the country aims to keep the level of global warming at 2°C above preindustrial times. The government has announced multiple plans and policies to achieve this target.

Finland is Europe’s most heavily treed country, with 86% of its land area under forest, whereby all Finnish forest are PEFC-certified. This has created several bioeconomy value chains, resulting in a strong development regarding the production of bio-based raw materials and processes. Since this development, the use of transport biofuels has rapidly increased in Finland. Thus, Finland has also some of the lowest energy prices in Europe today, both for industry and consumers. One further big trend are smart green city solutions, which could become (much sooner than one thinks) reality in the near future. The aim is that buildings are equipped with energy, material and water solutions that seek to burden the environment as little as possible. This should be first implemented in public buildings, later in private ones, too. Related to this topic, Finland offers a perfect test bed with advanced smart grid functionalities. Finland was the first country in the world to roll out smart meters registering electricity consumption data on an hourly basis to all

⁹⁸ <https://www.bmw.de/Redaktion/EN/Artikel/Energy/research-priorities-solar-thermal-power-plants.html> (09.05.2018)

⁹⁹ <https://www.pv-magazine.de/2017/06/28/start-ups-zu-viel-regulierung-und-buerokratie-gefaehrden-innovationen/> (09.05.2018)

¹⁰⁰ https://en.wikipedia.org/wiki/Wind_power_in_Germany (09.05.2018)

¹⁰¹ <https://www.power-technology.com/projects/bavaria/> (09.05.2018)

¹⁰² https://www.enterprisecanadanetwork.ca/_uploads/resources/Cleantech-Profile-Helsinki-Finland.pdf (09.05.2018)

residential customers. Consequently, Finland is unique in having several years' worth of detailed household level consumption data to be used for innovative value-added service development as well as for tariff structure development. Currently, there are approximately 4.000 Clean Tech companies listed in Finland.¹⁰³

4.4.2. Specific support programs

▪ Germany

While start-ups and start-up-investments did not use to play a major role in the German utility sector, this has changed to some extent since 2015. Many German utilities have established accelerator programs for energy start-ups. While these developments are still at an early stage, they are one milestone towards a more innovation-oriented energy business.¹⁰⁴

The business incubator for digital industries and media "WERK1.Bayern" and more than 20 other technology oriented incubators all over Bavaria offer not only working space but also guidance, coaching and an excellent network of start-ups and other entrepreneurs. To complete the supporting measures, BayStartUP organizes the famous business plan-competitions (with additional coaching), and the universities offer Entrepreneurship Centres, the Program Tech-

Founders, and they establish contacts to the best universities worldwide. As one of Germany's innovation heartlands and Europe's top ICT location, Bavaria is a driver of innovation in digitization. With over 1/4 of Bavaria's total GDP being generated by manufacturing, this industrial base is hungry for digital solutions. "Digital entrepreneurs „will find a strong market there. Bayern Kapital ([www.http://bayernkapital.de](http://bayernkapital.de)) offers as experienced financier venture capital for Bavarian-located seed- and start-up companies mostly in cooperation with private investors. Therefore, Bavaria is also interesting for investors to find promising high-tech start-ups and co-financing partners for bringing them to international success.¹⁰⁵

BayStartUP

BayStartUP is the Bavarian institution for the acceleration of start-ups, supported by the Bavarian Ministry of Economics. They navigate start-ups from founding to financing.

www.baystartup.de

Chamber of Industry and Commerce for Munich and Upper Bavaria

The Chamber of Industry and Commerce for Munich and Upper Bavaria provides full service to start-ups and informs and advises its member companies and founders on topics such as education and training, law and taxes, innovation, export and business succession.

www.muenchen.ihk.de/startup

¹⁰³ : <https://wwf.fi/mediabank/9906.pdf> ; <https://www.investinfinland.fi/documents/162753/197730/Finland+Fact+Book/7b46dfaa-209f-4e27-9147-3b7ed6624d8a> ; <http://advantage.marketline.com/Product?ptype=Countries&pid=MLER0046CNTRYOUTLK> ; <https://www.helsinkibusinesshub.fi/hbh-viewpoint-from-grey-to-green-building/> ; <https://www.helsinkibusinesshub.fi/hbh-viewpoint-from-grey-to-green-building/> (09.05.2018)

¹⁰⁴ <http://energypost.eu/cleantech-startups-can-german-utilities-bridge-the-valley-of-death/> Accessed on 09.05.2018

¹⁰⁵ https://www.stmwi.bayern.de/fileadmin/user_upload/stmwi/Publikationen/2016/2016-02-09-Start_ups-e.pdf Accessed on 09.05.2018

Munich founder office (MEB)

The MEB is a joint institution of the city of Munich and the Chamber of Industry and Commerce for Munich and Upper Bavaria. The MEB provides information and advice on all aspects of starting a business.

www.facebook.com/pages/IHK-Muenchen-und-Oberbayern

- **Start-up Accelerator Programs**

TechFounders

TechFounders is a 3-month start-up accelerator program based in Munich. Accepted tech start-ups get a project budget of 25,000 Euro as well as access to world class mentors, coaches and a high-tech prototyping infrastructure. During the program venture teams will get in close contact with leading venture capital companies and corporate partners like BMW, Bosch and Festo.

www.techfounders.com

WERK1.Bayern

WERK1.Bayern is an incubator for digital entrepreneurship in Munich. The campus provides facilities and an environment that supports founders. Residents benefit from valuable events, flexible contracts – starting with coworking up to single open-plan office – and an outstanding community of entrepreneurs.

www.werk1muenchen.de

Clean Tech VC's :

Excapital

Ecapital (early and late stage) has 12 promising cleantech portfolio companies. In July 2016, Ecapital announced a first closing of their fourth fund at €40M.¹⁰⁶

<https://ecapital.de/en/>

EnBW

EnBW (**early and late stage**) is the third largest utility in Germany. In 2015, they launched their corporate venturing business EnBW New Ventures with a dedicated €100M fund.

<https://www.enbw.com/>

High-Tech Gründerfonds

High-Tech Gründerfonds (**early stage**) is Germany's leading seed investor which manages 3 funds with a total volume of €820M, almost 500 seed investments, €1.2B follow-on investments from third parties and 75 exits since 2005. More than 10% of its portfolio is cleantech which makes it the biggest German cleantech VC in terms of number of deals. Many people think that successful early stage investing in cleantech can only be done with public funding. However, venture capital has got many success factors, above all the know-how and execution of the start-up's management team, the VC's management team and the proactive support of the fund's LPs.

<https://high-tech-gruenderfonds.de/de/>

¹⁰⁶ <https://ecosummit.net/articles/smart-green-vcs-you-should-know> (09.05.2018)

Munich Venture Partners

Munich Venture Partners (**early and late stage**) is a German cleantech VC with deep pockets that closed their second fund at €130M in 2013. The European Investment Fund is the largest LP. MVP's exciting portfolio features 50% cleantech.

<http://www.munichvp.com/en/home/>

VNT Management

VNT Management (**Finland and Germany – early and late stage**) is a Finnish-German cleantech VC with €157M under management that loves smart green hardware and electrical systems. VNT has an office in Munich and they consider Germany to be a key market for deal flow and sales.

<http://www.vntm.com/>



Finland

Business Finland

Business Finland is an accelerator of global growth. The institution creates new growth by helping businesses go global and by supporting and funding innovations.¹⁰⁷

<https://www.businessfinland.fi/>

Sitra

Sitra helps small and large companies to develop their sustainable consumer business and assists them in finding each other in order to launch new kinds of innovations and co-operation.¹⁰⁸

<https://www.sitra.fi/en/>

VNT Management

Venture capital Management Company in Europe that focuses on clean technologies, in particular renewables, electrical systems and energy savings. VNT is active in the Nordics and German-speaking countries.¹⁰⁹

<http://www.vntm.com/>

Loudspring

The Company invests in profitable, competitive companies that save natural resources. Loudspring has raised more than €180 million in financing for companies, successfully exited investments as well as own companies, assisted Finland's largest institutional investors in making total investments of more than €100 million in the cleantech business.¹¹⁰

<http://loudspring.earth/>

¹⁰⁷ <https://www.businessfinland.fi/en/for-finnish-customers/about-us/in-brief/> (09.05.2018)

¹⁰⁸ <https://www.sitra.fi/en/topics/sustainable-everyday-life/#what-is-it-about> (09.05.2018)

¹⁰⁹ <http://www.vntm.com> (09.05.2018)

¹¹⁰ <http://loudspring.earth/share> (09.05.2018)

Talsinki

The Talsinki Metropolitan Incubation project aims to facilitate the creation of new joint Central Baltic knowledge intensive companies and co-operation between them in the Tallinn-Helsinki area through a network of partners who develop and implement an integrated incubation service that addresses regional start-up ecosystem goals and utilizes common resources.¹¹¹

<http://cbtalsinki.eu/>

4.4.3. Insights

- **Germany**

Start-ups in the B2B area:

The majority of surveyed start-ups in the clean-tech sector are in the B2B area, with some of these start-ups wanting to target, in addition to private companies, state institutions as customers. In particular, if the business idea aims to address existing and emerging societal challenges, e.g. to counteract the enormous growth in garbage or increased automobile presence in urban centers. Although these projects are partly supported and funded by the Bavarian cities, there is often the difficulty finding contact with them or even being aware of them. Mostly, many bureaucratic hurdles have to be overcome before projects can be realized. One of the reasons behind this is that decisions regarding the choice of projects are only made at the highest instance. Most of the start-ups in this group see themselves as solution providers, meaning that they not only offer the customer the company's products, but also a comprehensive overall solution of integrated products and services. This approach is relatively close to the subscription model. Such business models are not uncommon in cooperation with public institutions, as they usually expect and demand a round-the-clock package for e.g. maintenance or replacement of the technology due to the customer-specific solution.

Start-ups, which primarily have private companies as customers, increasingly indicate that the general environmental awareness on the part of companies and end users is rising. This trend can also be seen as a reciprocal effect, since with growing interest in new sustainable concepts within the population, companies are encouraged to deal with resource-saving solutions. A significant advantage for companies is the positive effect on their own image and the associated marketing effect, by acquiring sustainable products (from start-ups). But new environmental directives, including from the EU, are also creating pressure for companies to adopt new solutions. For example, a start-up, which offers organizers and sponsors of endurance sports events thermal protector films made of bio plastic as an incentive for the runner and as an advertising space, said that the demand for bio plastics, according to the new EU directive, is increasing. However, it should be noted that start-ups in this area often find it difficult to have their products made from alternative materials like bio plastic, as manufacturers often consider the profitability of producing smaller quantities to be critical. Due to the plan of the German government to generate 45 per cent by 2025 and even 80 per cent by 2050 of the entire power from renewable energies sources, start-ups from this industry see a lot of potential regarding their own business idea according to this development. A renewable energy provider, who works on power generation through wave motion, has even told us that they see the future of power generation in their own innovative idea, because wave energy is considered as the strongest and most reliable source of energy worldwide. However, such start-ups face a number of challenges, such as testing the technology under real-world conditions and obtaining enough capital to produce prototype equipment. In addition, many players in the energy market are unaware of such new technologies and contact persons in different countries show little willingness to experiment. Due to the high degree of innovation of such products/services, there is only moderate to medium competition in these industries. A high degree of innovation and complexity also ensures that most start-ups in this group regard themselves as solution providers, similar to start-ups with state as the main customer.

¹¹¹ <http://cbtalsinki.eu/about/> (09.05.2018)

Start-ups in the B2C area:

As already mentioned, only a small proportion of the surveyed start-ups are in the B2C sector. Start-ups in this group preferably serve niche markets, which is why there are few to very few competitors in these industries. The mood on the current situation in the industry is mixed. A start-up producing solar-powered cars said that the infrastructure needed for electric mobility in Germany (Bavaria) lagged behind. Likewise, one has to struggle with prejudices against electric mobility in general. In addition, the automotive industry is very conservative in Bavaria, so entering the market requires a lot of professional work. However, despite all difficulties and also due to the diesel scandal of 2015 in Germany, which causes a slow rethinking within the population, the main trend in the industry clearly moves to electric mobility, next to new sharing concepts and autonomous driving.

A provider of sustainable insurances, which wants to invest insurance contributions in climate protection, education, organic agriculture or care, complained about the high capital requirements required to establish an insurance business in Germany. In particular, since it deals with the fight against important social problems, one would have wished for more support from the state. Whereas, a start-up, which offers vertical farming plantations for private customers is clearly more optimistic about the current situation in the clean tech industry. Although the concept of vertical farming is still at the very beginning of development, there is a positive trend towards sustainable private food production, especially in urban centers. By saving long transport routes, which are needed for grocery shopping etc., there is an enormous potential to reduce CO2 emissions and people are more independent from food retailing.

Most start-ups in this group are generally in the classic sales business. Therefore, exceptional business models for this group were less noticeable in the survey.



Finland

Energy efficiency/savings is one of the most important sub-sectors in the Clean Tech industry. Advanced digitization plays an important role regarding this topic by opening up many new opportunities to reduce energy consumption through digital products / services or analysis tools. Due to the fact, that Finland is the second advanced digital economy in the EU, because of its long history of information technology (global success of Nokia spurred the development of the software and electronics cluster in Finland)¹¹², many start-ups in this area are currently dealing with innovative digital solutions. Particularly in the B2B area, many customers see enormous potential in new digital technologies or analysis methods, which can reduce costs and, thus, maximize their profits. For example, one start-up has developed a measurement and data collection system that allows the electricity consumption of industrial compressed air systems to be reduced by as much as 30%.¹¹³ Such solutions not only save companies a lot of costs, they also protect the environment at the same time by lowering energy consumption. Finland is also one of the leading countries in the digitalization of the marine industries. This is not surprising as the shipping traffic around Finland is very heavy. Thus, Finnish start-ups see a lot of potential in this area. For instance, one start-up offers a digital system that continuously collects real-time data from ships at sea and provides guidance for their most efficient operation. As it decides which routes are best in several categories a significant amount of energy can be saved.¹¹⁴ But even in the B2C sector, new digital products aim to decrease energy consumption inter alia in private households. For example, a Finnish start-up

¹¹² <https://www.investinfinland.fi/documents/162753/197730/Finland+Fact+Book/7b46dfaa-209f-4e27-9147-3b7ed6624d8a>, Page 10 (09.05.2018)

¹¹³ <http://loudspring.earth/companies> (09.05.2018)

¹¹⁴ <http://www.rclcorporate.com/improved-data-leads-to-more-efficient-cruise-ships/> (09.05.2018)

offers a hardware device which identifies how much energy each appliance is using in a home and then creates customized recommendations of the smartest way for the family to save energy.¹¹⁵

In addition to energy saving approaches, the areas of recycling and waste management are becoming increasingly important. Accordingly, many start-ups come up with new innovative ideas that intend to save resources. Digitization plays an equally important role. One example for a start-up in the B2B area is a company which provides a software that analyzes wastewater pumping station data in order to detect pipe blockages and leaks immediately, without any human input or added hardware. Consequently, waste of water can be reduced immediately due to the quick detection of pipe leaks and less waste water (with a lot of pollutants) get discharged into the groundwater. However, such start-ups have to find contact to public institutions initially and, therefore, have to overcome bureaucratic hurdles like German start-ups. But also in the consumer sector (B2C), new applications, which aim to reduce resources, are becoming increasingly popular among the population. E.g. one start-up (has two-sided business model, that's why it's also partly a B2B company) develops and operates an innovative location-and-time-sensitive market platform that allows consumers to rescue valuable, edible food from being wasted unnecessarily: they purchase portions via the app for a lower price and retrieve the portions from the provider's venue. With this approach restaurants, bakeries, hotels, etc. can turn their servings surpluses into an opportunity to earn extra income and attract new clients.¹¹⁶ It's a win-win-situation for the consumers as well as for the gastronomic establishments with less waste of resources.

Similar to the German start-ups, almost all of these start-ups are located in niche markets and, hence, face only little competition. This is also related to the fact, that the whole cleantech market is generally small in Finland. Most cleantech hubs can be found in the area of Helsinki. Due to the size, many foreign companies also consider the Finnish market to be unattractive, which is why there is little foreign competition in these markets.¹¹⁷ Because of the high degree of innovation and the customized solutions most of the Finnish start-ups regard themselves as solution providers, alike most of the German start-ups in the B2B area. Only in the consumer sector there are some business models based on commission.

Because of the small market size, the majority of the start-ups are interested in an internationalization of their businesses, as well as in cooperation with other companies. Collaboration makes it easier to get into new markets and exploit synergies.

4.4.4. Outlook

An important long-term goal for start-ups is the market entry. Once it has been achieved, the focus is on establishing its business on the market, through expansion of their product range or general growth in the target markets. Businesses are really convinced of their business idea, so they are very strong intrinsically motivated, believing that they are making a difference and seeing it as having a real value. Thus, an exit is not a major reason why the business was started.

Collaboration with other companies is also an important goal, as it makes it easier to open up new markets and exploit synergies. At present some of the surveyed start-ups already cooperate with other companies or public institutions.

Most start-ups are interested in an internationalization, with some of the respondents placing particular emphasis on the European continent. For renewable energy companies, expansion beyond the local environment is particularly relevant. From an internationalization, the start-ups promise advantages such as greater opportunities for growth, increasing their competitiveness and promoting their long-term sustainability.

¹¹⁵ <http://loudspring.earth/companies> (09.05.2018)

¹¹⁶ <http://loudspring.earth/companies> (09.05.2018)

¹¹⁷ https://www.enterprisecanadanetwork.ca/_uploads/resources/Cleantech-Profile-Helsinki-Finland.pdf (09.05.2018)

4.5. Short excursion into...

4.5.1. EdTech

What does EdTech mean? Edtech is a combination of the word Educational and Technology, so the key of EdTech start-ups is the effective use of new technologies to improve our way of learning. Both at school and in private life, digitization facilitates access to knowledge. The field of EdTech companies contains language learning apps and playful learning apps for children as well as bringing digitization to schools and into the classroom.

The German and the Finnish education system are on very high standards. Being a teacher in Finland is well regarded and their social status is comparable to doctors and lawyers and when it comes to digital education Finland provides an infrastructure with 100% of the schools connected to the internet.¹¹⁸ Pasi Silander, the Digitalization Lead of Helsinki describes the new technology as “the tool for making learning processes visible for reflection and evaluation, documenting learning, processing information and searching information.”¹¹⁹ This mindset is a reason for a growing EdTech scene in Finland and will encourage young students and teachers to have a more open perspective on digital improvements.

▪ Accelerator

xEdu

The Finnish scene has the biggest EdTech Accelerator all over Europe and therefore a lot of very interesting start-ups on the field of education. xEdu is specialized in creating “transformative learning solutions with pedagogical impact”¹²⁰. Their program is available two times a year and includes intense 3 month of coaching and mentoring before the start-ups are joining a big alumni network. They offer a global network of daycare centers, schools and higher education institutes for collaboration and real life environmental testing. The support of the government allows the start-ups to get access to a global network of distinguished figures in the education sector.¹²¹

As part of the Slush start-up event, xEdu organizes the **XcitED** Conference in Helsinki to get all the players of the EdTech ecosystem together. A lot of interesting speaks about insights and trends are offered to the audience as well as the **Nordic EdTech Award** (<https://www.nordicedtechaward.com>). The Award is open to all EdTech companies and is held by a jury from all Scandinavian countries.

<https://www.xedu.co>

▪ Project Insight & Outlook

The most common business models in this area are Licenses and Subscription models as it mainly focuses on Software as a Service. “Many start-ups have roots in Nokia, the former telecommunications giant headquartered in Espoo [...]. With their background and expertise in mobile networks, it’s not surprising that many entrepreneurs are working on developing mobile solutions.”¹²² Over the last years the competition in the EdTech sector got bigger but there is still more potential in it. One of the biggest challenges of our interview partners has been the improvement of the usability and the acceptance in the schools or on the market in general. This also leads to a big entry barrier for Finnish start-ups, the marketing and sales of their product. A lot of the young companies do have some issues when it comes to selling their technology. The entrepreneurs are often only focused on improving their product and belief it will sell itself. This doesn’t match with the goal of the majority of the EdTech start-ups to internationalize their business and accomplish an exit in the future.

¹¹⁸ <https://medium.com/edtech-europe-tour/edtech-in-finland-e66252d6e8f6> (Accessed: 09.06.2018)

¹¹⁹ <https://www.enterpriseinnovation.net/article/how-finland-building-schools-future-309928159> (Accessed: 09.06.2018)

¹²⁰ <https://www.xedu.co/#about> (09.06.2018)

¹²¹ <https://edtech.careers/edtech-incubators-and-accelerators/> (09.06.2018)

¹²² <https://www.edsurge.com/news/2013-08-27-searching-for-finland-s-education-entrepreneurs> (09.06.2018)

As in any other industry the big trends of AI and Big Data will play an important role in the future of EdTech. As the Finnish Education System is getting more and more digital, the EdTech start-ups will find their way into the classroom and personalize the way of learning.¹²³ Consolidation of the currently fragmented market will be a driver for the future of learning. The pace of development depends on the digitization of the education systems. Gerhard Molin CEO of CEEDO (a Finnish EdTech start-up) even hopes that “we’ll move towards a system of school as a service supported by technology. There’s already a great example of a school as a service in Finland (...) in Espoo.”¹²⁴

4.5.2. Blockchain

Blockchain is in general a technology which eliminates the need for a third party. Blockchain is useful in databases with no intermediaries, where users still need security and trust for any transfer of data. The impact of this technology on the energy sector could be very considerable. Blockchain could play a key role in speeding up the renewable energy transition. It remains to be seen how these technologies evolve. The technology has the ability to allow peer-to-peer energy transactions. This could lead to a decentralization of energy production. By allowing peer-to-peer energy trading and incentivizing local consumption at the time of production, blockchain could stabilize the grid, aiding this decentralization. However, with users paying each other directly, many of the traditional market roles could be called into question, including distribution system operators, retailers, suppliers, metering point operators, balancing groups and more. This direct settlement would also support the principle of the sharing economy.

Blockchain could also be used for electricity tracking with at least two purposes: rewards for generating renewable energy and renewable energy certificates or carbon credits. For those who want to invest in renewables but lack the funds, blockchain technology could enable collective investments, ensuring fair and transparent sharing of revenues.¹²⁵

¹²³ <https://www.linkedin.com/pulse/edtech-next-5-10-years-from-finnish-perspective-svenia-busson> (09.06.2018)

¹²⁴ <https://www.linkedin.com/pulse/edtech-next-5-10-years-from-finnish-perspective-svenia-busson> (09.06.2018)

¹²⁵ <https://www.ekoenergy.org/blockchain-and-renewable-energy/> (09.06.2018)

References

Cargentur GmbH

Founders: Philipp Schlocker
City: Starnberg
Website: <http://www.cargentur.de>

We stand for transparency, honesty and professionalism in the used car market.

Our customers are advised by us professionally and personally, regularly informed about the current market situation and accompanied as best as possible until the sale of their vehicle. Prospective buyers are informed to the best of their knowledge in advance about the vehicles, professionally cared for and save so much time.

tacterion GmbH

Founders: Dr.-Ing. Michael Strohmayer CEO/CTO
Daniel Strohmayer Co-CEO
City: Munich
Website: <https://www.tacterion.com/>

Tacterion has developed a unique sensor layer for making curved, soft and complex objects sensitive to touch and pressure, called sensorskin™. Their market-ready, PET-based sensor solution PLYON®, enables innovative interfaces and measures principles in the areas of automotive, handheld devices, industrial IoT, and robotics.

whatsgonow – Die Mitnehmzentrale

Founders: Rabieb Al Khatib
City: Munich
Website: <https://www.whatsgonow.com/>

We connect people who want to send personal or commercial items from A to B with people who drive from A to B. The service is based on the shared economy idea and should facilitate this and facilitate the exchange of articles. It is also a source of income for private drivers and commuters.

Wrapclub GmbH

Managing Directors: Alexander Simonov und Marijana Bilos

City: Munich

Website: <https://wrapclub.de/>

Nowadays, with the new shared economy, everyone earns a little bit of money by sharing rooms, seats in the car or the whole car with others for money. Wraupclub makes it easy for the car driver to earn money for gas, insurance, service and more by merely providing the exterior of his car for advertising.

Wrapclub takes care of pasting the car with the advertising foil. All the car owner has to do is sign up, leave the car at the partner workshops and then drive his usual ways with the advertising on the car.

Wroomer GmbH

Founders: Guido Merz, Christian Roeckemann

City: Munich

Website: <https://wroomer.com/ux/>

Due to today's self-evident car financing and leasing options, Wroomer offers financing offers directly on one platform together with the technically and visually impeccable wish car, which of course also has the dealership warranty. All cars are shown with "rate@car". Just search for your dream car - either traditionally by make and model or by monthly affordable rate - and then choose suitable financing options from various banks. Wroomer describes this new, smooth-running financing process as "your next car experience".

Brainboost

Founders: Philipp & Tobias Heiler

City: Munich

Website: <http://brainboost-neurofeedback.de/>

brainboost Neurofeedback uses the computer-assisted evaluation of EEG signals, with which activity patterns in the brain become visible and accessible, for trainings, treatments and other areas of application such as occupational health management (BGM) or neuromarketing. It is the fastest and most direct way to understand, exercise and protect the brain. Using the most advanced EEG and software technology, it is possible to display activations and behavior patterns in the brain directly in real time. As a result, a wide variety of questions can be dealt with, from stress reactions to images or real situations to extraordinary adaptations in top athletes to studies in the field of neuromarketing. The technology also allows for treatment through neurofeedback training.

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Contact

▪ Accompanying professors:

Prof. Dr. Hariet Köstner	hariat.koestner@hs-Augsburg.de
Prof. Pauli Lindström	pauli.lindstrom@haaga-helia.fi

▪ Participating students

Jasmin Gerner	jasmin.gerner@hs-augsburg.de
Elena Hillenbrand	elena.hillenbrand@hs-augsburg.de
Rica Holzmänn	rica.holzmänn@hs-augsburg.de
Carina Kein	carina.kein@hs-augsburg.de
Julian Kohl	julian.kohl@hs-augsburg.de
Victoria Kunz	victoria.kunz@hs-augsburg.de
Simon Lang	simon.lang@hs-augsburg.de
Liridona Mamaj	liridona.mamaj@hs-augsburg.de
Dennis Thiel	dennis.thiel@hs-augsburg.de
Christiane Weinhold	christiane.weinhold@hs-augsburg.de