STARTUPS IN SERBIA

A glance at the startup ecosystem in Serbia

A study conducted for and on behalf of the German-Serbian Chamber of Commerce by:

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FOREWORD
AND ACKNOWLEDGEMENTS

Over the course of conducting this study, I met with various startups, hubs and incubators, investors, initiatives and networks, and one thing that all stakeholders have in common is the goal to promote the local ecosystem and startups, to help, and to share.

I had the pleasure to engage in interesting conversations and to discuss views, projects and numbers. Not only were the discussions open, I was also let in on the good and the bad of various startup journeys as well as the latest ideas and ambitions.

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INTRODUCTION AND SCOPE

The Serbian economy is known to be centered on traditional industries and sectors and less known for its entrepreneurs and startups. This has been changing in recent years in light of the growth exhibited in this area and the success of local startups internationally.

Nordeus created the most downloaded and played football game 'Top Eleven', Seven Bridges Genomics has become a leading biomedical data company specializing in software and data analytics, and Fishing-Booker is the world's largest online travel company for fishing trips. Attention and media coverage was also elevated through recent transactions around Frame and 3Lateral.

The aforementioned companies are a few examples of a much more vibrant ecosystem. They serve as guide and motivation for new ventures, that it is doable to create a great startup from Serbia. There may not yet have come a unicorn from Serbia, but there are some very interesting and successful startups reflecting the ingenuity and capability of local entrepreneurs.

So while there may be lots of good ideas and excellent technical skills, starting up in a smaller market has some drawbacks. Access to funding is a dominant issue and seems to hold back the ecosystem both in growth and development. Also accessing international markets for selling products or solutions requires skills and expertise that are not readily available in the ecosystem.

Compared to the entrepreneurial hotspots in developed markets such as the U.S., UK, or Germany the Serbian startup ecosystem is rather small, (still) in an early stage and it remains fragile. But it is nevertheless buzzing, growing and evolving.

Local companies have started to observe the developments in the startup ecosystem and some have increased their engagement also as a way to enhance their corporate innovation. And the Serbian government has lifted digitalization and startups on its priority list, but it remains to be seen which actions will be taken to foster this development.

The study takes a closer look at the Serbian ecosystem and is a snapshot of a changing environment with information and insights on the current state. It aims to shed a fair amount of light on each of the main participants, i.e. the startups, the support system provided by hubs and incubators, and of course the investors. A particular focus is laid on startups and their journeys, deriving conclusions on what in general is needed for startups and the ecosystem to develop better and faster.

In the following, a startup shall be defined and characterized as a business in its early development stages (usually up to 5 years), typically started by
the founder or a small team of founders (generally a team of 3 to 4 people), with the goal to solve a problem in an innovative way. These entrepreneurial ventures are in search of a repeatable business model, that can be scaled very quickly, but which is also subject to high uncertainty.

In contrast to other sectors and industries, startups are usually in early stages of their ‘corporate’ lifecycle, built around an idea that may fail, and some startups may not even be incorporated. Therefore, traditional methods of measuring and categorizing companies do not necessarily apply. Hence, a small disclaimer on completeness of information seems in place. The study is based on information provided by companies and organizations deeply connected and working with startups, however, it cannot claim completeness regarding the number or classification of startups in the market.

Overall, this study intends to provide a glance at a very interesting, innovative and fast developing area. The brief on the stakeholders is intended to facilitate not only understanding, but active outreach and ideally contribution. The ecosystem will benefit from external input and resources, intellectually, financially or otherwise. And with further interest in Serbian startups, more of the local ideas and projects can be supported.
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MACROECONOMIC BRIEF ON THE SERBIAN ECONOMY

The Serbian economy has left the struggles of the financial and economic crisis behind and has entered on a growth path in recent years that is expected to be maintained in the years to come.

The Serbian government succeeded in consolidating the public budget and to reduce the overall level of debt (in 2017, the debt-to-GDP ratio dropped by 10 percentage points to 58%). The outlook on growth is positive and comes from improvements in the fiscal system which are also reflected in the recent budget surplus for 2018.

The positive outlook has also been considered in the recent rating update by S&P (country rating of BB with positive outlook). An upgrade to investment grade rating (BBB), which is the declared goal of the Finance Minister for 2020, is in reach in the near future if growth is sustained (and is not negatively affected by macroeconomic developments in the Euro zone), public debt is further reduced and the economy is not otherwise affected by external imbalances.

Another cornerstone for the economic development is the latest arrangement with the International Monetary Fund (IMF) signed in July 2018 which will help anchoring economic and fiscal stability. This 30-month policy coordination instrument aims at maintaining macroeconomic and financial stability and progressing structural and institutional reforms.

The goal of sustainable growth is in reach with GDP growth expected to be in the region of 4% annually. While the pre-crisis growth was mainly driven by consumption, it is now based on the country’s investments, private consumption and exports.

The GDP in 2018 is set to reach a 10-year high of 4.2%, while 2019 is expected to be around 3.5%.

Future growth depends on addressing structural issues relating to a large and modestly reformed public sector and gaps in the country’s infrastructure. In addition, Serbia is dealing with a shrinking population and 'brain drain' in the form of emigration of young and educated people.

The positive trend in economic growth and activity is also reflected in the employment statistics, with unemployment rate decreasing from 22.1% in 2013 to 11.3% in Q3 2018, which translates into an employment rate of 49% or just over 2.1 million jobs in a country of 7 million people. While Serbia will continue to encounter current account deficits of ca. 5% of GDP, these deficits are lower than those seen at the beginning of the decade (around 10% of GDP).
These current account deficits are expected to be fully financed through foreign direct investments (FDIs) which have seen a significant increase in recent years. FDIs reached a new high in 2017 with EUR 2.5bn flowing into the country, however 2018 is set to even exceed this mark, as EUR 2.0bn were recorded after three quarters already.⁷

Notably, the EU represents the most important investor with over 70% of FDIs (both 2017 and 2018). With the Netherlands leading the list of investing countries, Germany has moved to third place after matching its prior year investments of ca. EUR 185mn already after Q3 2018. Note that this represents only the origin of the funds, not the location of ultimate decision making.

Investments are however still directed towards traditional industries in Serbia, with construction and real estate activities together with manufacturing receiving half of all investments. 2018 shows a similar distribution with an even stronger focus on manufacturing (31%).

FDIs have also led to a strong increase in exports of goods and services, which in turn makes Serbia quite dependent on the confidence investors have in the country. There are also improvements in the monetary system as the National Bank of Serbia (NBS) has worked effectively in recent years to keep inflation low and relatively stable which led to an anchoring of inflation expectations.

Inflation clearly stayed within the band of ±1.5%⁸ around the target rate of 3.0%, and inflation is expected to remain below the target midpoint in the current year.
A GLANCE AT THE ICT SECTOR IN SERBIA

The IT sector, and in particular the software industry, is the fastest growing sector of the Serbian economy. Many companies were established as outsourcing centers providing programming services and the like, but a significant portion of these have advanced and adjusted their business models to also develop their own products.

Belgrade and Novi Sad stand out as the most prominent locations, both in terms of number of employees and company revenues.

The Serbian economy is still dominated by traditional sectors such as manufacturing, construction, wholesale and retail as well as agriculture. ICT has been increasing in recent years and contributes 5% to GDP, which is in line with European averages that fall in the range of 3% to 6%.

In terms of investments, the ICT sector received close to EUR 200 million or ca. 8% of FDIs coming into Serbia in 2017 (see previous chapter).

The increase in ICT exports over the last couple of years is remarkable and is driven by an ongoing demand for software development as well as outsourcing of services from companies abroad. Annual growth rates are above 20% for this period.

Software exports account for 90% of ICT exports and represent 2% of GDP.

A new milestone with software exports reaching EUR 1.2bn was achieved in 2018.

On the other side, domestic IT spending and investment is significantly falling behind in international comparisons. Companies worldwide invest about 3.5% of their revenues in IT, while in Serbia these investments account for only 0.7%. A similar picture is drawn for employment of IT professionals. Companies abroad have on average over 5% of their employees in IT, while IT employment in Serbian companies is just shy of 2%.
The ICT sector in Serbia counted in 2017 about 2,400 companies and employment for ca. 42,500 people. A main part of the ICT sector is held by the telecommunications subsector, with almost 16,000 employees in 250 companies. In the IT subsector, there are about 2,150 companies and 200 are being newly established every year, the majority of companies are classified as software companies (over 60%), accounting for 18,000 employees of the 26,500 in IT. Employment numbers in software development exhibit also a year-on-year growth of over 20%.¹¹

With respect to compensation, there is of course a large range depending on job specifications and the location. However, salaries in IT are clearly above average salary of ca. EUR 420 per month. Average pay in the software sector is EUR 1,450, while the outsourcing subsector pays EUR 1,700 on average.

Also the Government of Serbia has identified the importance of the IT industry for the country’s competitiveness. With its ‘Strategy for Development of the IT Industry for 2017-2020’, the government plans to invest into retraining of workforce and in infrastructure, as well as to improve the business environment. In addition to a delay of one year for adoption of the strategy, the IT community argues that important issues are addressed, but concrete actions are missing for most items of the strategy.¹²

Overall, innovation is a key driver for the industry in order to stay relevant and competitive in international markets (90% of Serbian IT companies conduct business activities abroad). However, there is little cooperation with R&D institutions in Serbia as only one third of the companies have established some kind of collaboration with the R&D sector.

The competitive advantage of the sector lies in the good quality of the products and services, high responsiveness to client needs and specialized programming skills. On the downside, the supply of skilled labor lacks behind the demand, there is ongoing brain drain and local IT companies can do better in terms of product sales and marketing skills.¹³
There are over 260,000 students enrolled in the universities and higher schools in Serbia, across various fields and levels of education. The interest in ICT subjects is clearly visible from the growing number of students in related studies. More than 16% of all new students in 2017 enrolled in ICT-related studies.

ICT programs are held at 51 institutions for higher education, out of which 13 are state-owned universities, 19 private universities, 18 state-owned (vocational) colleges, and 1 private college.

Students prefer higher education (academic studies as compared to vocational studies) by a clear margin (67%) and choose state-owned schools (78%), which in turn can be explained to some extent with their reputation, but also because private education is not for free.¹⁴

A similar dominance can be seen for locations. While ICT studies are available in 23 cities across Serbia, Belgrade and Novi Sad are ahead in terms of number of institutions and students alike. When looking at graduation numbers, about 5,500 ICT experts graduated in 2017. Taking other related technical studies into account, this number increases to ca. 12,000 or 23% of all graduates.¹⁵

With about 1,300 IT graduates each year, the faculties of Electrical Engineering, Mathematics and Organizational Sciences in Belgrade, the Electronic Faculty in Niš, and the faculties of Technical Science and Natural & Mathematical Sciences in Novi Sad form the backbone of the IT education.

While established companies in the ICT industry may prefer to hire workforce with higher education qualifications (about three-quarters of all hiring), formal education is less relevant for startups (there is no tick-the-box HR procedure), as above anything else skills and know-how are sought after, not degrees.

Nevertheless, Serbia’s higher education system cannot keep up with market demand, both in sheer numbers and qualifications needed in the market. There is a necessity to change the curricula in higher education to cover knowledge and skills that are required from software engineers and the like in their future fields of work. Informal education and self-acquired knowledge has bridged that gap so far in the market. Widening the IT knowledge base is also important and has started by introducing programming in elementary schools.
The majority of IT graduates will find a job in local IT companies. However, international demand in this area has also led to an increased outflow of IT graduates and young professionals.

Brain drain is a major concern for the local industry with respect to its future competitiveness, as well as for the country.

Serbia continues to lose skilled people every year with estimates around 30,000 per year (2015 saw emigration spiking up to ca. 60,000).¹⁶
Startups in Serbia, given they are incorporated, are dealing with the same issues as any other company, i.e. bureaucracy, widespread but not integrated administration, a slow and in many ways outdated legal system, a financial market that is shallow and not integrated in international markets, and lots of paperwork.

There is no particular framework for startups in Serbia no real incentive system, no concrete guidance, nor some other form of encouragement for tech or innovative ventures to start a business here. Existing incentive schemes aim at reducing unemployment in general and are mostly tax-related.

Truth to be told, it is in fact quite easy (even though paper-based) to incorporate a company, but this is not the typical path startups are taking. In most cases, these ventures formally incorporate rather late, usually when they are about to receive funding (either from investors or in form of grants). It is not a business driven decision to account for costs and expenses related to turning the idea in a product or conducting R&D. Hence, especially startups in the early stage simply continue their venture as a team working on a solution, without formalization of their business. Incorporation implies for many that strings would be attached and dealing with bureaucracy and government administration.

Previously adopted incentives provide exemptions with respect to taxation of salaries. For example, exemptions are granted for 2 years for employers who hire people that have been registered as unemployed for more than 3 months and are under the age of 30. Other employment incentives provide the possibility for employers to apply for a refund of salary tax and social security contributions for newly hired employees (subject to certain conditions on the employment).

The Serbian Parliament passed amendments to tax laws, including the laws on personal and corporate income tax, at the end of 2017 introducing tax relief for salaries paid to employees in newly incorporated legal entities. In particular, salaries paid to the first nine employees as well as to the employed shareholders and entrepreneurs are fully exempt from salary tax and social security contributions for the first 12 months of employment. The exemptions are applicable for entrepreneurships and legal entities established before December 31, 2020.
More recent amendments to the law on corporate income tax were passed at the end of 2018, introducing specific incentives for the IT sector, as R&D will be tax deductible in the amount double than the actual costs incurred. Another incentive relates to investment in startups. Companies that invest in the equity of newly incorporated companies performing innovative activities may be entitled to tax credits of 30% of the investment (capped at RSD 100 million or ca. TEUR 840).

The issue with the aforementioned tax incentives is that they relate mostly to employment. Early-stage startups may not be registered, and if they are, these companies usually do not employ many people. Secondly, if startups grow and start hiring, they look for highly skilled people, and software developers are in high demand anyway and less likely to be unemployed.

As for the incentives related to investing in startups, it remains to be seen if this is a practical tool to create sufficient impact and investment volume from new investors and companies.
A community for and exchange between entrepreneurs in Serbia has been in place even before the term ‘startup’ reached Serbia. But what we refer to as ‘startup ecosystem’ has been developing and growing over the last decade and includes startups, investors, and equally important a support system which is made up of hubs, incubators, various organizations and recently also the Digital Serbia Initiative.

The aforementioned stakeholders cooperate, openly share and communicate with each other and external parties. They actively contribute to the ecosystem and are connected through a mission to foster this ecosystem, to make it work and to grow it. Despite the growth of the ICT sector and success of various startups in recent years, the common notion is that the ecosystem is still in its early development phase and very fragile, especially to external effects of the economy and politics.

There are various hubs, incubators and accelerators that provide a number of programs, seminars and events for entrepreneurs to connect, learn and develop. A common aspect is that all centers offer coworking space which is not exclusively for the startups in the respective programs, but open to people with a wide range of ideas and interests. Designers and programmers sit side-by-side to architects or businessmen. The renting of desks and office space is ultimately covering costs for the hubs and is an important aspect of their financing.

Most programs for startups last about 3 months and cover relevant areas of finance (planning and budgeting), marketing and sales, legal aspects, product verification and go-to-market strategies, among others. However, it seems that these programs offer similar content and address startups in general, without further specialization or specific sector or domain focus. Hence, there is competition among the incubators and accelerators, and it does occur that a startup goes through several programs. Events seem to duplicate topics and there is an overlap in mentors, experts, speakers and audience.

Nevertheless, the community is well connected and there is a growing network of people who contribute. Also media coverage (in addition to the social media activities around the ecosystem) has been picking up lately on news and topics related to local startups.
In order for the ecosystem to thrive further, a better coordination and some sort of consolidation among the hubs and incubators seems necessary.

At the moment, there is no specialization or focus on specific startup groups or topics and the programs offer in principle a standard guideline for building a startup. But each startup is different and so are their journeys. A critical point that is missing is the direct exposure to potential clients and customers early on, which is not part of the startup programs currently being offered. Early verification of ideas, testing and failing is crucial. Also, many startups target international markets (given the limited size of the market at home and the region), but have not had any exposure to these markets. Being from Serbia does not mean that one cannot travel and explore, get inputs and experience that is helpful in making the product relevant and hitting consumer demand. What stops a startup from going to the U.S. to attend a conference or spend time in a hub or accelerator and exchange with other startups in the same domain? This is equally true for any B2B-oriented startup. A face-to-face meeting is always better and builds more trust that is indeed needed in a high risk set-up.

Hubs and accelerators can provide links and introductions much better and foster exchange. It does not mean that the startup will pack bags and relocate the next day, but it is about valuable experience that can then be shared locally. And when in doubt of where to work and live, the pure cost aspect of building a startup here will always be in favor compared to locations in Western Europe or North America.

On the other hand, and similar to the overall economy, external input is needed to shift the ecosystem. A new player with international experience and outreach would greatly contribute through a new approach, different methodologies, mentors and contacts to VCs for funding and potential clients. And maybe other areas (such as medtech or robotics, which can tap into a strong resource and knowledge base from mechanical and electrical engineering) would receive more interest as well.

Cornerstones of the support system
The following provides an overview of the main contributors and organizations actively engaged in developing, shaping and supporting the startup ecosystem.

SEE ICT AND STARTIT
SEE ICT is a Belgrade-based, grass-root and non-profit organization established in 2010 with the mission to provide meaningful support to the Serbian technology and startup scene, to foster higher employment and economic growth.

In a mutual effort together with the Ministry of Culture, Startit was founded in 2012 with the goal to improve the capacities of the local IT community to start innovative and successful entrepreneurial endeavors. The activities and programs have reached more than 100,000 people and a significant number of investment rounds in Serbian tech startups were raised by startups from these programs.

Since then, Startit has developed into the most popular tech media space in Serbia, and Startit centers were opened across the country to provide physical working and meeting space for the community, which are being visited by 25,000 tech professionals and enthusiasts every year.

Startit Centar
The first Startit Centar was founded five years ago and centers can now be found in eight cities (Belgrade, Indija, Novi Sad, Vršac, Zrenjanin, Valjevo, Subotica, Šabac) across Serbia. They provide workspaces for 60 to 200 people depending on the location, while the Belgrade center is also home to a VR lab. The centers run numerous community events and education programs for current and future IT professionals and are in partnerships with all relevant companies from the field.

The centers are supported by local partners, including Nordeus, Telekom Srbija, Tradecore, Société Générale, Microsoft, among others.
Startups in Serbia

**Startup Academy**
The academy is an accelerator and has been the first in Europe to become part of Google’s new development program: Google Launchpad. The latter is a global acceleration program that helps startups build and scale great products by matching them with Google’s people, network, and technologies.

The academy, now in its seventh year, trains and educates startups in the fields of product and validation, marketing and sales, business development and investments, etc. The program is supported by experienced mentors and well known entrepreneurs, who share experience and advice first hand.

More than 120 startups have gone through the academy and went on to raise more than EUR 5 million in investments. 15 companies that were successfully built are now generating EUR 20+ million in revenues. Among the alumni are recognized startups such as Alchemy, Fishingbooker, Farmia, and many more.

**ICT Hub**
ICT Hub was launched as part of a public private partnership between DNA Communications and Orion Telekom together with USAID in 2014 as an incubator for technology entrepreneurs. It started out in the Science and Technology Park, and moved to the Belgrade city center in 2017.

As the other hubs, ICT Hub has created programs to educate startups and to provide necessary mentoring and support in business development, including the outreach to partners and investors. The hub has been working with about 20 early stage startups each year since inception.

Under the label ICT Hub Playground, the hub provides coworking space for up to 90 people and a place where the local startup community can meet and connect and where trainings and seminars are held. There is also a small lab to work on and test tangible prototypes.

ICT Hub has moved on from being a sole incubator and increased its links and cooperation with companies. The overall idea is to be a connector between companies and startups, as companies may seek for inputs and ideas for their own innovation, while startups can test their ideas and products and get much needed market feedback, expert opinions and potentially a client. Cooperation partners include local corporate heavyweights such as Société Générale, Delhaize, VIP mobile, NIS and Philip Morris.

ICT Hub further realized the need for additional funding for startups in the early stages and together with local businessmen set up ‘ICT Hub Ventures’ in 2017 (see section 9, ‘Availability of funding and the role of investors’).

**Business Technology Incubator of the Technical Faculties Belgrade (BITF)**
The BITF incubator is located in the Science and Technology Park Belgrade and has been established as a partnership between the four technical faculties of the University of Belgrade (Civil Engineering, Mechanical, Electrical and Technological/Metallurgical), the Municipality of Palilula and the Democratic Transition Initiative.

It was the first incubator established in Serbia back in 2007 with the mandate to encourage and support young and technically educated people in starting up their own businesses in Serbia and to provide further support in the early stages of business development.

The BITF provides startups with office and co-working space, conference rooms and other facilities, including a workshop with 3D printers, etc. Training programs for startups are organized to cover financial planning, intellectual property rights, product sales and marketing skills, etc. It is backed by numerous mentors and business counsels (for legal, accounting and administrative aspects of small business), as well as a network of companies and supporters.

With only 5 startups applying for the program in 2008, over 40 applications are now received each year, while from the 90+ startups that went through the program, over 80% are still active and employ over 500 people. Alumni include HTEC, MBrain-Train, TeleSkin, 3HeroesStudios, and many more.
The Science and Technology Park is a good example of how innovation and startups can be supported. This has been recognized by the Serbian Government and transformed last year in an undertaking to create technology centers in various major cities across Serbia. This is part of a wider initiative to invest into the IT infrastructure with planned investments of EUR 65 million over the next three years. The European Investment Bank is providing a loan of 60 million for this purpose.

A new Science and Technology park in Novi Sad is about to be completed, and the foundations for the park in Niš were laid at the end of 2018. Other innovation centers are planned for Čačak, Bor, Zaječar and maybe Kraljevo.

**IMPACT HUB**

Impact Hub is already in its fifth year in Belgrade and located in the very center in the former facilities of Radio Belgrade. It is a true meeting point for entrepreneurs and social innovators and offers coworking facilities, standalone offices and meeting rooms. It is part of the global Impact HUB network with 100+ locations in 50+ countries.

Impact Hub hosts regular events and programs to educate and support entrepreneurs. Among other things, startups can apply for the bootcamp, which is meant for companies that have already created a prototype and that aim for the global market, however, with a focus on the U.S. market. About 10-15 teams are chosen each year for the program, which is in turn supported by 20+ mentors and international experts. Among the supported business are urbigo, whiperr, woobox, to name a few.¹⁷

The price tag stands at about EUR 500 and the trainings address business competences in general (market research, pricing, cash flow planning and budgeting, etc.), with a focus on sales skills (proof of concept, sales funnels, and product/market fit, etc.). Needless to say, it offers networking and potentially easier access to finance, including Impact Hub’s Venture Growth Accelerator (see section 9, ‘Availability of funding and the role of investors’).

Over the four years with the program, the hub held over 2,000 conversations with startups that yielded 1,000+ applications out of which 110 startups participated in the program. After completing the program, 11 managed to receive external funding, either in form of grants (7 startups), or as direct investment (4 startups).

**STARTUP CENTAR**

Startup Centar is an incubator for students of all faculties that want to learn about entrepreneurship and build their companies. It was established in 2017 and is located at the Faculty of Economics in Belgrade as a result of the cooperation between the faculty and MVP Workshop. It is one of the rare programs that directly targets students as entrepreneurs.

The program is run twice per year with 4 teams per semester and is split in a 3 months’ learning and work phase with mentors and another 3 months’ phase for developing the ideas with additional coaching. The project is set for five years and so far 25 students completed the program, 5 startups were launched and 70 lectures and workshops were organized.

**NOVA ISKRA**

Nova Iskra is a creative hub, founded in 2012 in Belgrade, that hosts a variety of designers, researchers, entrepreneurs, activists and innovators. It has 2 locations in Belgrade, in Sava Mala and Zemun, and is set to open another location in Dorćol. All locations provide workspace for over 320 people mostly in coworking spaces, but also offer meeting rooms and some private offices.

The company runs numerous events, lectures and seminars and education is endorsed through own programs, mentoring, webinars, creative camps, workshops, multidisciplinary working groups, peer-to-peer exchanges, etc.

Nova Iskra was acquired in September 2018 by rent24, a global coworking and coliving company, founded in 2015 in Berlin.
ICT CLUSTERS

ICT clusters are business organizations with the mission to represent and develop the IT sector in Serbia, and to provide institutional support to local IT companies.

The objective is to increase the visibility of Serbian ICT by building a strong network of international contacts, creating new business opportunities for the members, compiling industry reports and data, lobbying for improvement of the business environment, and popularization ICT, both in terms of generating more ICT professionals and through enabling more penetration of these technologies in other sectors of the economy.

The first cluster was established in 2010 in Novi Sad (Vojvodina ICT cluster), which has now over 30 members and an outreach to over 4,000 IT professionals. Other cluster include the ICT Network Serbia Cluster, Niš Cluster of Advanced Technologies, ICT Cluster of Central Serbia, IT Cluster Subotica and Zrenjanin ICT Cluster.

BIOSENSE INSTITUTE

The BioSense Institute (Research and Development Institute for Information Technologies in Biosystems) was founded in 2015 to foster multidisciplinary research in the fields of micro and nanoelectronics, communications, signal processing, remote sensing, big data, robotics and biosystems.

It combines two prominent sectors in Serbia, ICT and agriculture, with the goal to support the development of sustainable agriculture. The institute brings together relevant stakeholders, including government, ICT community and agricultural producers.

The institute coordinates or participates in a large number of international research projects, including Horizon2020, FP7, Eureka, among others. The BioSense Institute plays an important role in innovation acceleration with more than 50 SMEs funded through these programs and the cooperation with industry partners.

SWISSCONTACT

Swisscontact is an independent business-oriented foundation for international development cooperation, represented in 36 countries. It has been in Serbia for about 4 years with the focus on supporting the support system, i.e. to build capacity and know-how in the ecosystem.

The foundation contributes by engaging international experts to actively work with hubs and incubators in their startup programs for several weeks. The goal is to bring the contributors in the ecosystem closer together and to increase the quality of the various programs to ultimately make an impact on the success and survival of the startups.

More than 70 international experts contributed directly to various programs and initiatives over the last 3+ years.

OTHER NOTEWORTHY INITIATIVES

With the exception of Startit and their centers in various cities in Serbia, hubs and incubators are located in Belgrade. The business incubator (poslovni inkubator) in Novi Sad is another exception. Since 2010 the incubator supports startups in the field of information and communication technologies and creative industries, organizes events, trainings and workshops, and provides 20 offices or co-working spaces.

EastHub is an accelerator that helps innovative companies from Serbia to reach big markets. It literally takes the startups and brings them over to the U.S. to educate them and to establish access to funds. It is supported by the Serbian Chamber of Commerce. The hub conducted the first call for startups to join the program in October 2018. After the pitch in December, 4 companies were selected to take part in the training program in the U.S. covering sales/marketing, finance, business development, etc. with support from mentors and experts in these areas. In the end, the program also provides the opportunity to pitch for financing from VCs. A new call is planned for Q2 this year.
Recently, large local companies have started to set up their in-house incubators to drive innovation and get relevant input for their lines of business. **Delta Holding** started its ‘Delta Biznis Inkubator’ program in 2018 to provide a platform for startups in the core business areas of the Group: logistics, distribution, agriculture and real estate. 6 teams from over 160 applications were selected to go through the 3-months training with mentorship, access to Delta's network and financial support for the initial development of their business. A new round for application will be opened in May 2019.

**Telekom Srbija** recently announced the opening of a new center for startups. The incubator will be located in their premises in New Belgrade and offer work space, mentorship and a platform for exchange for startups. The company further plans to directly support certain startups financially.

The objectives are to enhance education, to improve government policy and modernize the regulatory framework to create a better business environment, as well as to support the ecosystem for tech startups in Serbia.

A national initiative for digitalization

Digital transformation provides challenges for economies to adapt and keep up with the changes and challenges it brings with it. There is need for significant cooperation and coordination between stakeholders in this area, including companies, government and institutions across education, legislation and regulation.

This has also been recognized by a number of founders and influencers in the IT sector, but with the view to create an opportunity for Serbia to play an active role, instead of missing out. The success of certain IT companies and startups should not be perceived as the result of chance, but rather as the outcome of coordinated actions and forward-looking reforms in the economy, that enable growth and prosperity in the digital space.

This led to the creation of a new initiative advocating the transformation of Serbia into a digital society. **Digital Serbia Initiative (DSI)** is a non-governmental, non-profit organization founded in 2017 by a consortium of partners, including Infostud, Microsoft Development Center Serbia, Nordeus, PricewaterhouseCoopers, Ringier Axel Springer, Seven Bridges Genomics, Startit, Telekom Srbija and Telenor.

The initiative has been growing to 23 members, who not only invest their resources, knowledge and experience, but are represented by their leaders who are personally committed. It also sees the government as one of its main partners in the effort to digitalize the Serbian economy and society.

The Digital Serbia Initiative is a powerhouse that can actively address shortcomings in the Serbian economy and society towards various stakeholders, and drive change faster and more direct.

In a short time since inception, the initiative contributed to changes in the formal education. Computer sciences are now part of the school curriculum from fifth grade. Kids learn to program in Python using the platform developed by Petlja. Other initiatives focus on addressing shortcomings in higher education, as current studies do not address the knowledge and know-how needed in the market. This is tackled through assessing demand (with direct input from IT companies) and amending the curriculum, as well as the introduction of new programs in universities in the near future.

DSI also provides access for founders to the technical expertise of the large member organizations, enabling proof of concept and potentially partnerships. The improvement of the general business environment is also high on the agenda, as the initiative addresses limitations in existing laws and regulations with respect to digital transformation and provides recommendations.
GENERAL OVERVIEW OF STARTUPS IN SERBIA

There are undeniably great ideas and ventures in the local startup ecosystem with a high level of technical skill and expertise. However, the quantification and classification of startups holds a few challenges.

To start with, many ventures are not formalized, i.e. not registered as an entrepreneurship or limited liability company, rendering official resources such as the company register (APR) of little use. In addition, no official data on startups has been collected. On the other hand, many startups do apply and take part in programs offered by hubs, incubators or investors, but these can of course not claim completeness and may be subject to double counting. And lastly, many startups are in a stage where friends sit together writing code, and there is simply no statistic nor estimate available on these ventures.

All-in-all, the quantification is difficult and attempts to put a number or to map startups were not successful or not completed. The Digital Serbia Initiative conducted a survey at the end of 2018 in which 130 startups were invited and 106 completed the questionnaire. The Serbian startup ecosystem will be covered in much more detail through the global Startup Genome Research, with questionnaires open from January 2019 and results expected in June 2019.

Local startups in numbers
The main conclusion is that there are over 200 startups in Serbia; a number which has been confirmed from various other sources over the course of this study.

200+

STARTUPS IN SERBIA

It may seem conservative, but it depends on the definition of a startup and the time horizon considered. A startup should be innovative and have a scalable business model. It is a business in the early development stages, so usually not older than 5 years.

Other sources claim over 700 startups to be present in the market, however, this number needs to be qualified as the listed startups date back to the early 2000s (and are therefore not a startup anymore) and hundreds of entries have not been verified.¹⁸

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For the purpose of the aforementioned survey, startups were defined as entities with at least one employee or having obtained some financing from a third party, hence, it is a necessity that these ventures have actually been incorporated. The vast majority of the companies (77%) is registered in Serbia, while U.S. and UK are popular destinations for incorporation (11% in total). The latter is also driven through the availability of and access to funding, a topic that will be later discussed in more detail.

Of the startups surveyed, 22% were founded within the last twelve months, while over 50% exist for two years. Interestingly, 20% of the companies have been in business for five years or longer.

As in other areas, also startups are dominated by male founders. With only 3% sole female founders, Serbia is no exception to the rule and in line with international averages. On the upside, almost 20% have a female co-founder and the share of women working in IT startups in the area of software development is approaching 15%.

Startups also directly contribute to economic growth and employment. The 106 startups in the survey have created over 1,700 jobs. While the vast majority employs up to ten people, this share accounts for only 21% of total employment, while the 3% of the largest startups employ about 31%.
About success and failure
Given the limited information and tracking over time of local startups, it is not possible to estimate the survival rate for startups in Serbia. Looking at some international numbers, it is said that 90%¹⁹ of new startups fail, and even 75%²⁰ of startups backed by VCs fail, taking into account the usual survivorship bias for reporting.

Survival is closely connected to funding. Startups in early stages are generally self-funded, bootstrapped or funded by business angels. Raising seed money is the first major barrier, but given that this is successful, it seems even more difficult to raise a Series A round, as up to 80% of companies do not make it.²¹

Interestingly, with a Series A in place, it does get relatively easier to obtain follow-on financing. Not all startups that do not get financing will necessarily cease to exist, some will continue and run a good business, but will not show the metrics a VC would expect to see in order to qualify for financing in the first place.

This is important when looking at the investment portfolio. For a VC, the outlook is more or less that out of 10 companies in the portfolio, 5 will be losers, 3 will continue as small businesses with some profit, 1 will be a medium-sized and profitable company, and 1 will be a winner (over 10x return on investment). Hence, VCs make investments across a range of companies, ideas and talent to diversify and to account for the skewness in the return distribution.

Applying these insights on the Serbian ecosystem provides once again a few headaches. Only few hubs and incubators properly track the development of the companies that went through their programs. For example, the incubator in the Science and Technology Park states that over 80% of the companies that went through their programs in the past are still active, but, as with all other programs, only very few have obtained additional external financing and managed to scale successfully. However, it is still an encouraging result that companies have been created that continue to build their business in the local market.

When it comes to failure, there are more obvious reasons for failure, such as inexperience or personal problems of the founders. Some founders simply lack focus or motivation, other cannot fully commit to this one idea. Others are unwilling to listen or take advice from the wrong people (good mentorship is really important). The reasons for failure are of course different from startup to startup, but the following list shows the common issues²²:

1. No market need (42%)
2. Ran out of cash (29%)
3. Not the right team (23%)
4. Got outcompeted (19%)
5. Pricing/cost issue (18%)
6. Poor product (17%)
7. Need/lack business model (17%)
8. Poor marketing (14%)
9. Ignore customers (14%)
10. Product mistimed (13%)

[Graph showing survival rate of startups]
Interestingly, most of these issues are related to the business, the team and of course the product, but they boil down to leadership and the leader’s ability to build a team and the right business model.

However, many entrepreneurs have not succeeded with their first ideas or startups. Many have failed a few times, pivoted on ideas or scratched them, just to start over again. Persistence and resilience is an important trait of entrepreneurs and even more so in markets where there is little support for startups.

Serbian entrepreneurs are indeed resilient, which is to a large extent the result of the market and economic conditions. With little resources available, they tend to be more imaginative and innovative. So while great ideas are being developed (i.e. good progress around ideation), local entrepreneurs experience huge problems in developing a product out of an idea (or even a minimum viable product, MVP) and starting to market that product later on. This has been recognized by all hubs and incubators and programs spend a significant amount of time on this area. Product development is equally important as constant testing to sanitize the unique selling points and sales channels alike. Also the Digital Serbia Initiative has identified this challenge and stated the creation of a product-centric culture as a priority in their manifesto.²³

Another problem relates to dealing with failure, which is probably more prevalent for startups. To stigmatize failure is embedded in the local culture. Instead of encouragement to pursue an idea, an entrepreneur would encounter more often arguments and comments as to why it cannot succeed. Failing is not regarded as a valuable experience, neither locally, nor in Western Europe. The U.S., however, have the culture in which starting a business and trying something new is regarded as valuable and also failed entrepreneurs are regarded as an asset for a company if they join given their ability to pursue a project and work independently. And local startups should be supported and encouraged that way.

When it comes to setting up a business, startups are facing the same difficulties like other founders, as most administration is time-consuming, paper-based and authorities are not well connected. Serbia is ranked number 48 for ease of doing business according to the World Bank. This number may seem acceptable in terms of regional comparison, but it is far from competitiveness according to EU norms.

An important aspect is the integration of the Serbian market in the international markets. Serving customers (mostly B2C) abroad presents difficulties for companies from Serbia as products or solutions cannot be listed on certain standard platforms (e.g. app stores), unless a company is registered abroad.

Another obstacle for startups is of course financing and the limited sources of financing in the local market.

There is a limited number of investors active in the market, and startups seek for financing abroad, instead of investors providing funds directly into the local ecosystem. Also, some forms of financing, such as crowdfunding (lending based or equity), are simply not yet allowed and therefore present in Serbia. An issue in this area is that certain laws have not been amended or updated to account for alternative investments which invest in startups are. The law on alternative investments is not only late to have finally reached a draft, but even if presented to parliament as planned in the second quarter this year, it will take time for implementation and the judicial system usually struggles in the interpretation and application of totally new laws.
A CLOSER LOOK AT SERBIAN STARTUPS

Having outlined the startup ecosystem and put a measure on the startups, the following section provides a more detailed analysis of the industry and sectors, the development stage, as well as target markets and customers of Serbian startups.

Industry and sector coverage

The diversity exhibited by the industry and sector coverage reflects on the wide range of ideas pursued by Serbian startups. The survey conducted by DSI asked startups to select their fields of business and specialization with the following results:

In line with the talent and skillset, software development (here classified as enterprise solutions) ranks highest among the sectors in which startups operate. This is followed by energy and environment oriented ventures, including ideas for smart city, and then by gaming, which is not surprising given the success of Nordeus. AI, big data and analytics as well as blockchain ranked fourth and fifth, respectively, top off the dominant areas in which startups are active, accounting for ca. 54%.

Note that the overview is not exclusive, i.e. the survey allowed for multiple answer choices. For example, a company can be working in the field of social media, but may also be doing data analytics.

Besides the apparent programming skills in Serbia, there is another reason why the software sector, including startups, is flourishing.

There are virtually no barriers to enter.

![Industry and sector coverage chart](chart.png)

Source: Digital Serbia Initiative
All that is required is a computer and some programming software. And through self-education a significant base of skilled people has been developed.

However, the formal education system in Serbia is also very strong in other areas, such as natural sciences (mathematics, physics) or electrical and mechanical engineering, with various universities in the country producing scientists and engineers. But applying this knowledge to set up a startup that is not solely software oriented is usually more difficult as it requires machines, tools and materials for testing and prototyping, which are expensive or not easily obtainable for startups. Needless to say, it requires significant financing which is not available to most startups.

Hence, talent and capacity alone do not make an impact. There is of course too little cooperation and exchange between universities and the private sector in these areas to foster innovation. For startups to be successful, it requires at least easy access to general tools and equipment for testing and prototyping, which may be available in some institutions, but which are not easily accessible for startups. In addition, materials or components are expensive and while financing is problematic, a cooperation with companies might bridge this issue, and lead also to better idea development and products as these companies can provide direct market feedback to the startups.

There is strong overlap between engineering and programming, for example in robotics, agritech, medtech, environment and energy, automotive industry and areas of automation, but at the moment there are too little initiatives and actual facilities to drive innovation and growth in these areas.

**Everybody is talking about blockchain**

Blockchain has been a hot topic for some time and the conversations have finally shifted away from crypto currencies only, which are of course one application for this technology.

Remarkably, Serbian startups have a leading position in this development. There are at least 20 local startups involved in blockchain, while a wider community counts about 50 members, including established companies interested in this area.

Through the Serbian Blockchain Initiative an industry network for businesses interested in and working on blockchain solutions was created in 2018. The initiative is a non-profit, non-government organization, with the goal of supporting blockchain adoption and proper legislation in Serbia.

Among the founding members is MVP Workshop, a specialized blockchain product development company established in 2016 in Belgrade. The company has been around blockchain from the beginning and has grown to 45 people.

According to Ivan Bjelajac (CEO of MVP Workshop) Serbia is currently at the forefront of the blockchain development, as it has been an early adopter of the blockchain technology, again due to the low barriers to enter. In addition, there is a great talent pool of developers in Serbia and the region. However, it remains to be seen over the next 1-2 years whether Serbia can maintain its position as active contributor, or whether it will move to the second line and become a passive follower. The latter is not a negative development per se, it means that local companies will do eventually more collaboration work or outsourcing with international partners, instead of leading cutting edge solutions.

In terms of product development, another local startup stands out. Blinking, which employs now 20 people, was founded in 2017 with the goal to develop multi-factor identity management tools for secure authentication based on blockchain technology. It recently completed a proof of concept with 2 Serbian banks (AIK and Société Générale) for a digital identity management platform for the exchange of data in the KYC processes.

In contrast to other startups that seek large international (consumer) markets, blockchain companies can do well in small and regulated markets, mentions Alex Migitko (CEO of Blinking). When it comes to personal data and data protection, platforms need to adhere to local laws and regulations and specific solutions have to be
developed. But given that it is early days in blockchain, getting the first contracts and taking the revenue hurdle is difficult.

Another interesting aspect of blockchain is that it creates access to new sources of financing. Companies can obtain funding through initial coin offerings (ICOs). If the offering is successful, it provides instant liquidity and does not involve the more conventional funding sources such as Angel or Venture Capital funds. OriginTrail, a startup that is addressed later in this section, raised EUR 18.4 million (USD 22.5 million) in an ICO in early 2018.

**Development stage**

Measuring the development of startups is a difficult undertaking as little data is available regarding the startups in the first place, even less about their stage of life. Milestones, such as product development (or MVP), market entry and revenue generation are hard to track and are not systematically observed by the hubs and incubators.

Based on the insights gathered from meeting various stakeholders in the local ecosystem, the general conclusion is that most startups are in the phase of formation up to MVP, with another major group being in the phase of product testing and bringing it to market. Companies have also reported that they have first customers and are generating some revenue, but only few have verified their business model and are ready to scale.

The survey conducted by Digital Serbia draws a slightly different picture. The results suggest that startups are in more developed stages as over 63% are making revenues or are in a growth stage. This may not be applicable for the ecosystem in general, but holds true for the companies surveyed, and is a result of the selection criteria for the survey, i.e. companies were already formed, most have hired people, or are making revenues.

**Target customers and markets**

Most startups have targeted companies as their customers; a result that is confirmed through the Digital Serbia survey. Business models around B2B are also the preferred choice of the local investors.

Government bodies and institutions are not seen as potential customers. This can to some extent be explained with the public procurement procedures which basically exclude startups from participation due to formal reasons (years since incorporation, profitability, etc.) and because they usually ask for a final product or solution (instead of accepting a prototype or MVP) in areas where technology is just being developed.

Most startups have further recognized the limitations of the local markets (i.e. Serbia and extending to the countries of former Yugoslavia) in terms of the sheer number of potential customers and the ability to create revenues.
The vast majority of startups have planned from the beginning for an international outreach of their product, i.e. beyond the borders of former Yugoslavia. However, product testing and first customers may still be in the home and neighboring markets.

According to the DSI survey, the U.S. as target market dominates all other destinations and is followed by the EU market.

**Selected success stories**

No, there is not a unicorn in Serbia, not yet, but quite a few interesting and successful companies have emerged from the Serbian startup scene. And when there is finally a successful sale or take-over, even traditional media coverage is guaranteed. But in contrast to the general belief, these success stories did not happen overnight. As the ensuing examples will show, these companies have been built over the course of many years, by dedicated founders who put their money on the line and may have more than once faced dire straits. Success comes after all the hard work and it requires also to believe in oneself and the idea, because nobody else would.

**Nordeus** is a gaming company from Belgrade, widely known for its 'Top Eleven' football manager, with Jose Mourinho as the face of the game for many years. It was founded by Branko Milutinović together with 2 college friends, Ivan Stojisavljević and Milan Jovović, in 2010.

Having moved to Copenhagen to work in Microsoft as developers, the team was eager to move back to Belgrade and do something on their own. With savings in place to get the venture roughly through one year, the first game Top Eleven was launched on Facebook in May 2010 and made the company profitable – after 3 weeks. In 2011, the game was released on Android and iOS, becoming the first true cross platform game. 2012 brought 4 million downloads, and the company grew from 33 to 80 people, while being awarded as best employer in SEE. After 5 years, the game already hit the 100 million user mark, which has increased to over 170 million these days.

Nordeus did not seek external financing in order to stay independent, knowing it was also a good portion of luck to have had a product and business model that generated revenues from the start. The company seems on track for its plan to continue growing (up to 250 people) and to build a sustainable gaming company. Nordeus recently launched another game (Golden Boot) and significant effort is put in the development of further games.

Being from Belgrade may not have been the reason for success, but it would not have counted as an excuse for failure. It is a matter of the mindset for Branko Milutinović. While Serbia may not be the ideal location for starting a business, there are some competitive advantages, such as the relatively low cost of living and less competition for highly skilled developers as compared to the Silicon Valley for example.

Over the last years, the company has been giving back to the community, becoming one of Serbia’s largest philanthropists, by building 11 pediatric units at hospitals around the country, and multiple donations for healthcare and other purposes. Nordeus is also involved in various initiatives to support the startup ecosystem and is co-founder of the Digital Serbia Initiative.

**Seven Bridges Genomics** is a leading biomedical data company, specializing in software and data analytics to drive public and private healthcare research.
The scalable, cloud-based platform empowers rapid, collaborative analysis of millions of genomes in concert with other forms of biomedical data. Thousands of researchers in government, biotech, pharmaceutical and academic labs use Seven Bridges’ platform, including three of the largest genomics projects in the world: U.S. National Cancer Institute’s Cancer Genomics Cloud pilot, the Million Veteran Program, and Genomics England’s 100,000 Genomes Project.

It was named one of the world’s smartest companies by MIT Technology Review in 2016, and is a three-time Bio-IT World Best of Show winner.

It is a Serbian-American company, co-founded by Deniz Kural and Igor Bogićević, who joined in early 2010. The company has offices in Belgrade, Boston, Istanbul, and San Francisco. Until the end of 2018, Igor worked in the company as CTO (now moved into an advisory role for the company) and was heading a team of 130 software engineers in Belgrade. The decision for Belgrade came on the back of the accessibility to engineers and his network locally and in the region, and of course the lower cost base. Scaling the operations was a challenge, admits Igor Bogićević:

‘Hiring the first people and building a team was hard and took some time. Only with the core team in place we were able to grow significantly, even doubling in size for a few years in a row. And I had to grow with it, personally, building my managerial and leadership skills.’

Seven Bridges Genomics was able to obtain financing of over EUR 81 million (USD 98 million) in 3 financing rounds (Seed investment in 2014 of USD 3 million, Series A of USD 45 million and Series B of USD 50 million in 2018). Funding was needed to elevate the company and to scale the business and to deliver on the various contracts it obtained to build data analysis platforms in the research areas of cancer, pediatric disease, etc.

Despite the access to funding and the ability to raise substantial money, there has been also a downside. With funding secured, the company was put on track to scale fast, very fast. In doing so, it did no hit the right sales channels immediately and found itself in a cash constraint that had to be resolved with follow on financing. The latter was not a problem since the sales channels had by then been identified, but it was costly for the owners since it meant giving up additional equity for the new financing.

Today, Seven Bridges Genomics is a great example that it is possible to create an ambitious company out of Serbia.

FishingBooker is the world’s largest online travel company for fishing trips. It offers over 26,000 trips in 1,800 cities and 99 countries. It was established by Vukan Simić in 2013 based on an idea to create a platform for fishing trips. This particular industry is a billion dollar heavyweight in the U.S. alone.

Vukan started out alone but quickly built a team of a dozen people within a year. While the booking site was operating and generating revenues, hiring people and marketing was costly and created cash flow problems during year one. At that time, he, as the owner, invested his own savings (ca. TEUR 60), and stayed without a paycheck in the first year, being supported by family. While the company never took money from external investors, it scraped by bankruptcy more than once in this initial phase.

Many competitors raised serious VC money, but faced high costs (for rent, team hire, etc.) and failed to implement the idea. Being located in Serbia actually helped in that respect. FishingBooker was part of the second generation in Startit’s Startup Academy and, in hindsight, the team was attested to having had a more mature and focused approach, which led to the success that followed. But the academy provided also a useful network which led to several team members being hired from the connections made there.
Mindset of the people played an important element for the hiring, (and still is an important element) as people need to be positive and aspirational and not have the notion that not all is lost in Serbia and that things can be moved, according to Vukan Simić.

The company has thrived without external investments so far and the plan is to stay independent, while further growing the business and expanding it based on the current platform.

CarGo can be seen as the Serbian answer to Uber. It is an application through which a ride can be ordered and payment is arranged via credit card (in-app payment) or through CarGo credits. CarGo operates with its own drivers and is independent from taxi associations.

CarGo offers transportation which is 30% cheaper compared to a taxi ride and the company is preparing for green mobility by providing rides in hybrid and electric vehicles (30 hybrid cars were added to the fleet in Belgrade by the end of 2018). The service is currently available in Serbia (Belgrade) and Switzerland (Zurich), while further expansions into Austria (Vienna) and other countries of the Western Balkans is immanent.

The startup was launched by 2 Belgradians, Marko Vučić, who has previously worked for Uber, and Vuk Guberinić who is the CEO of the company. The idea was to provide a solution to urban transportation that stands out from traditional taxi services, which meant to disrupt this market.

As it turned out, competition with the established taxi companies presents a significant problem for the young company. With the taxi association in Belgrade lobbying against CarGo, a change in the Law on Passenger Transportation was adopted in October 2018 with the aim to ban alternative transportation businesses such as CarGo from the market. Despite the change in law, the company continues to operate, while it maintains the dialogue with the Parliament with the backing of large IT organizations in Serbia. Other obstacles previously faced by the company related to payments and the use of internationally accepted payment solutions such as apple pay or paypal (at the time not possible in Serbia due to laws on foreign exchange operations). This was overcome through other, local solutions to provide a seamless and convenient service to the customer. Ultimately, the customers’ vote is in favor of the startup, with 250k+ app downloads so far and ca. 50k active users. As of today, CarGo has transported over 1 million passengers, counts over 5,000 rides per day in Belgrade alone (a significant uplift from ca. 1,000 rides in 2017) and has taken a market share of ca. 10%. The growth benefitted from several major taxi strikes in Belgrade in 2018 where customers simply switched to CarGo for the first time and remained customers since. And as Vuk Guberinić puts it with a smile:

‘Once a customer has experienced our service with the comfort of ordering, the ride itself and payment, they will not go back to old-fashioned taxis.’

Since inception, the company was predominantly financed by the founders, with a small investment by 2 private Angel investors in 2017 in the total amount of TEUR 100. All other costs related to the startup and early expansion were bootstrapped, while later development and expansion was covered by the revenues generated by the business. Given the acceptance in the local market and the increasing number of rides, CarGo has been profitable for some time. The company is currently preparing for a larger financing round to support a faster growth and the regional expansion.

‘I want to get a (VC) partner on board to back up the business and to enable our further growth and development. We are determined to overcome adversity, to prove that we belong here and to succeed.’,

says Vuk Guberinić.
Agremo offers a cloud-based software platform for agribusinesses, crop growers and anyone interested in crop and land status and health. Agremo performs analytics from aerial imagery, leveraging AI, computer vision and machine learning, to provide for better crop management. It provides a visualized, user-friendly, geo-referenced map of a field, which allows clients to count plants, detect diseases, weed and pest problems, water stress, etc. Ultimately, the technology is meant to help achieve sustainable production, improved yields and lower production costs. The platform is compatible with any equipment type, including all commercial drones and sensors as well as data collected by satellites.

The idea, then named 'AgriSens', was developed in 2014 by Milan Dobrota and his co-founders Rastko Čarapić and Nebojša Pavičić. Milan, in contrast to many of his peers, is a rather 'advanced' founder, with prior experience as head of IT in an international retail group and after setting up 'LOGIT' in 2012. The latter is by now an established software development company, operating in Serbia, Bosnia and Romania, just shy of 30 employees. It served as the springboard for Agremo and has been the biggest source of financing. AgriSens obtained early financing in 2015 in form of an EU grant (Future Internet Enabled Agricultural Applications, under the funding framework of the European Commission ‘Horizon 2020’) in the amount of TEUR 140, allowing to pursue and test the idea. Since then, the company has successfully developed the product and entered various international markets, including the US market, which turns out to be the fastest growing and most promising.

As the venture progressed and revenues were on the horizon in 2017, it was spun off into Agremo. 2018 saw revenues growing already by 7 times year-on-year.

Delivering on the product and revenues enabled a recent seed financing round led by South Central Ventures together with Startlabs in which Agremo secured close to TEUR 500 in December 2018. The funds enable the company to further grow their team and expand their customer base in different geographies worldwide.

Over 100,000 hectares of arable land in more than 100 countries have been analyzed so far. In light of the continued positive development and increasing revenues, Agremo is planning for an additional financing round to scale the business. Milan is preparing the pitch to obtain Series A financing ideally by Q3 2019. The goal is to break even soon, while pushing for more sales channels in the existing markets and to enter new ones.

'It is exciting times and I am looking forward to the investor presentations. We have been in contact with various VCs so they know our business and product and we can focus the discussion on market strategies and revenue generation.',

says Milan Dobrota.

TradeCore is a full-service fintech company at the forefront of innovation in the finance world. TradeCore products help brokers manage their clients, giving them a centralized system with an intuitive and modern interface.

The company was founded by Stefan Pajković in 2013, having previously worked in banking as a trader in London. He co-founded GlobalTraders in 2000, led the expansion across the UK, Canada, Thailand and Russia, and managed the exit in 2007 (acquired by Purple Capital for USD 50 million).
Given Stefan’s background and prior experience, TradeCore was set up to provide the tools to lead and grow a successful brokerage. There are two distinct products: BrokerIQ is a broker management software for client onboarding, ID verification, payment processing and client management; BrokerCloud is an innovative Platform-as-a-Service for creating fintech solutions. TradeCore can operate across FinTech, RegTech, payments and crypto verticals and adds additional value to the business by reducing costs and optimizing workflow.

In the beginning of 2018, TradeCore raised EUR 2.5 million (USD 3 million) in a Seed round from South Central Ventures. The funds are required to support international expansion, to enhance product development velocity, and to raise brand awareness.

OriginTrail developed a protocol designed to tackle the prime challenges in product supply chains using blockchain technology. It resolves 3 issues of supply chain data solutions: scalability and cost issue of blockchain, fragmentation of data, and sensitive data that underpin a stakeholder’s competitive advantage.

It is a Slovenian-Serbian company with now offices in Ljubljana, Belgrade and Hong Kong, established in 2013 by Tomaž Levak (CEO), Žiga Drev (COO) and Branimir Rakić (CTO). The founders worked on an application for origin tracking during university.

OriginTrail started prior to 2013 with a tracking version for beef products, followed by dairy products, poultry and vegetables in 2015. In 2016, the company had over 20,000 shoppers and 1,200 farmers using the system. In that year, blockchain was introduced given its potential to ensure the trustworthiness of data in origin tracking systems used by thousands of consumers. In 2017 and 2018, the team started then working on an open-source protocol and decentralized network.

The company has recently been implementing a pilot project for a food retailer in China (the world’s largest market with 1.4 billion consumers) that will help consumers verify the origin, authenticity and journey of their products. The solution got significant traction in the Chinese market, where it won the Innovation Spark Award of the Walmart Food Safety Innovation Center in 2017. Other awards included the Belgrade Venture Forum in 2014, the Open Data Incubator for Europe in 2016 and the People’s Choice Award at the Food+City Challenge in 2017.

The company was able to generate revenues early on which helped building the company and reduced the need for financing. However, external financing was still needed and total funds of ca. EUR 500 were obtained through funds and angel investments. Early in 2018, OriginTrail raised EUR 18.4 million (USD 22.5 million) in an ICO to build its blockchain-based platform for global supply chain tracking. The ICO was a huge success with USD 1.5 million raised in the first hour and the funding cap reached within 3 days, underlining the demand for a data exchange for supply chain. The funds are intended for building out the platform and increasing international presence.

Active Collab is a project management and collaboration solution helping teams across the globe to stay aligned, get projects done faster and on budget, track progress and improve, and bill their clients.

It was founded as A51 by Goran Radulović and Ilija Studen in 2007 and is now based in Norfolk, Virginia, and Novi Sad.
A CLOSER LOOK AT SERBIAN STARTUPS

The open source version of Active Collab was launched back in the summer of 2006 as a side project of one of the founders. It showed a lot of potential, but consumed a huge amount of time without generating any income. The company was then registered in the spring of 2007 with the purpose to develop and support a commercial version.

For over a decade, the company helped more than 50,000 teams in companies ranging from small businesses to Fortune 500 companies, universities, and government institutions to solve their project management problems by making the best possible project management software for creative professionals. Some of the prominent users include NASA, Apple, Samsung, Nike, IKEA, Adobe, Cisco, BBC, Universal, but also Universities like Stanford, Berkley and Princeton, and many more.

Although not quite a startup anymore, it was one of the first software developers from Serbia to gain international traction and success. It is now an established company with an impressive track record.

Clockify is a free time tracker and timesheet app for teams of all sizes. It is a modern web app that works in all major browsers, on all three mainstream desktop platforms and across mobile devices. The app tracks productivity, attendance, billable hours, and payroll.

Clockify is used by everyone from freelancers, small businesses, and consulting agencies, to government institutions, NGOs, universities, and Fortune 500 companies like Hewlett-Packard, American Express, Siemens, Amazon, Cisco, PwC, and Bloomberg.

Starting in 2009 as a small software consultancy rooted in Novi Sad, Nenad Milanović grew the team to over 50 people. The company is incorporated as COING Inc. and headquartered in San Francisco, but the majority of people work in the development center in Novi Sad. Clockify itself was released in August 2017.

The original idea was to create a time tracking tool for company purposes to avoid charges for existing applications that can add up to hundreds of dollars per month. Clockify intended to replicate the market leader Toggl, as everyone likes to have an equally good and free substitute for something that is an industry standard.

After one year of operation, Clockify reached over 160,000 active users, all through organic growth and without spending on marketing. There is of course constant adjustment and further development according to users' needs and feedback. Clockify raised the standard for free time tracking applications and the promise is to keep all core features free of charge. Revenues are generated from users who want extra functionality and subscribe to a different plan. This income pays for infrastructure, support, and further development. The company is entirely bootstrapped and has not taken external investments until now.
Successful startups that managed their exits

Bringing a startup to the stage where it can scale, is a success in itself. But the real reward comes with the successful exit of the business. The following section provides examples not only of successful Serbian startups, but of those that were acquired or otherwise managed their exits.

3Lateral is a Novi Sad-based company founded in 2008 by Vladimir Mastilović. The game studio focuses on designing more realistic computer-generated human characters.

Epic Games, which operates the Unreal Engine game development platform, has worked with 3Lateral in the past on projects to push the level of realism and detail that are possible with human avatars. The acquisition will further expand the capabilities of Unreal Engine users to promote more detailed character design.

The 3Lateral team of 60+ people has been joining the Unreal Engine team and are continuing their work with existing partners across the video games, film and television industries. 3Lateral’s Serbian headquarters serves now as a base for Unreal Engine for recruiting technical and creative talent in the region. 3Lateral founder Mastilović is now heading Epic Games’ worldwide digital humans efforts.

The transaction was announced on January 23, 2019 with a sales price of ca. EUR 100 million.

Frame, also known as Mainframe2, was founded in 2012 and is a Serbian-American startup with headquarters in San Mateo, California, and the software development team in Niš, Serbia. Frame develops cloud-based desktop applications and is the only global, infrastructure-independent platform built to deliver Windows applications from the cloud.

Nutanix, a U.S.-based company, is one of the leaders in the field of cloud software and its products are used by numerous world organizations to transfer desktop apps and software tools to a cloud.

With Frame, Nutanix customers will be able to deliver desktop-as-a-service (DaaS) from multiple clouds, combining the simplicity and web-scale design of cloud applications with the functionality of traditional virtual desktop application. Nutanix will be able to address customer requirements for DaaS in the mid-market, while continuing its long-standing support for large-scale VDI projects delivered via enterprise datacenters.

Frame received early recognition in the industry leading to various financing rounds with VCs in the period from 2013 to 2017 with a total funding volume of USD 28.5 million (or EUR 25 million). The transaction closed on August 2, 2018 as a share deal worth USD 165 million (EUR 143 million), and represents a landmark as the largest startup buy-out from Serbia to date.
Drytools started as a SaaS platform for software developers creating high quality applications faster. It was founded in 2015 by Marko Gaćeša, Duško Vesin and Nikola Milinković in Novi Sad.

After presenting the product for the first time and subsequently winning at the Spark.me conference in Budva in 2016, a financing round with SC Ventures in the amount of TEUR 500 was secured. The funding was planned for expanding the team and developing a solid marketing and sales strategy.

Shortly after in 2017, drytools merged with Alchemy, a Silicon Valley-based software company for the global specialty chemicals industry that accelerates the development of new products.

ManageWP is the first and most successful WordPress website management service enabling web designers and developers to manage multiple WordPress sites from a single dashboard. It was founded in Belgrade in 2010 by Vladimir Prelovac and launched its services in 2012. It was in essence a fully bootstrapped company.

GoDaddy, founded in 1997 in the U.S., is one of the world’s biggest web hosts and domain name registration companies with over 60 million domains registered at the time.

In its attempt to diversify, GoDaddy acquired ManageWP to offer better publishing tools. 8% of ManageWP customers were already on GoDaddy. ManageWP continues to operate as an independent company under the GoDaddy umbrella and the entire team of about 30 people joined GoDaddy and remains based in Belgrade.
AVAILABILITY OF FUNDING AND THE ROLE OF INVESTORS

Traditional forms of financing do not apply to startups. Startups are not bankable due to the high-risk nature of their business: products are usually just being developed and revenues are in the majority of cases expected only in the years to come.

The rate of failure is high and specific sector and technology expertise is required to identify the right bets that will turn into highly successful companies. Institutional investors, i.e. Venture Capital funds (VCs), dominate the investment space around startups.

The local startup ecosystem has limited access to financing and it is fair to say that more funds and a more heterogeneous investor landscape would benefit the ecosystem. It is a bit of a chicken-and-egg problem whether it first requires the startups and investment opportunities to attract money or whether additional money can ultimately lead to more startups and ventures being undertaken and spur a stronger growth and development within the ecosystem.

Not just since the latest exits and takeovers of local startups has the ecosystem proven its potential, but more international investors have yet to set foot on the ground. Many hubs, incubators and the local investors confirmed that a lot of international VCs have been reaching out in search for investment opportunities, but actual deals have not emerged. However, it does require international and smart investors to impact the ecosystem and to provide additional funding of course.

Looking at local investors, it can be concluded that this asset class, i.e. alternative investments, is probably not well understood, given the high risk nature and the respective funding schemes (early stage, high risk investment for a minority share and no direct control/influence on the company, no hard collateral).

Educating local investors and to build investment capacity would further contribute to the diversity of available funding and the development of the ecosystem.

The investments could come at any stage for the startups, as very early stage angel investments, pre-seed or seed, or as growth funding via Series A, B, C, etc. The conversations with relevant stakeholders in the ecosystem showed, that especially very early stage support and follow-on financing is missing.

In particular, there are no angel investors in the market, hence there is no funding for a wide range of startups requiring small investments. This, however, is much needed to encourage and support as many startups as possible (to be precise, those with promising ideas) in order to increase their chances of success by getting them to the next development stage and potentially
new funding. This will increase the diversity of startups and provide a broader investment base for the investors focusing on later rounds.

Also follow-on financing has its shortcomings. Investment volumes for seed and Series A rounds are smaller when compared to international benchmarks. While this would be beneficial for investors, there is actually only one investor in the market that can directly provide financing (South Central Ventures). Hence, more international money is needed, and startups are required to go where the money is and pitch abroad. Pitching is also a valuable exercise and experience that too few local startups have actually gone through. Establishing links not only to investors, but also to accelerators, mentors and potential clients is crucial to make this work.

With respect to pitching and pursuing investments from VCs, one should not underestimate the resources it requires from startups. Mostly the CEOs, who are in many cases also the lead developers, invest an incredible amount of time in preparing pitch decks and presenting at various events or on a roadshow for VCs directly. This time investment is a high opportunity cost for the company as other areas such as product development suffer. In addition there is direct travel cost which can be substantial for trips to the US and several weeks of presence in the Valley.

Obtaining financing can only serve as a bridge to reaching milestones (mostly revenues), but it comes at expectations of revenue growth set by the VCs. Relying on this financing and not being able to keep up with product development or sales creates various problems as follow-on financing dries up and revenue streams are not sufficient to support the company.

The question why international investors do not invest directly in Serbia is usually being addressed with the assessment of Serbia as a high risk market, which is mainly based on the limitations and restrictions of the capital market as well as the economic and political environment. While this is true in the traditional view, it has to be reconsidered for investing in startups. Investing in startups is in itself very high risk, hence the lean startup methodology to fail fast. And to fail fast without burning a lot of money holds a competitive advantage for startups from Serbia.

Investing in local operations is significantly cheaper than in developed markets, while the execution is probably better.

While this is a good argument in favor of Serbian startups, international funds may still not consider establishing local operations as established VCs have plenty of investment opportunity lining up in front of their door. It may also mean that the startups will incorporate abroad (depending on investor preferences), in order to have a familiar legal framework for the investor and to have a presence in the market to drive sales. It is an organizational aspect, while operations, which will grow due to the funding obtained, will in most cases remain local (this is also the demonstrated way of startups described in the previous section).

Having said that, failures will happen nevertheless. However, when it comes to financing, previous startups and unsuccessful attempts are actually regarded as a plus, as the founder has gone through a high learning curve before, which increases the chances of success for the current venture, and for the startup to obtain financing. This section provides an overview of past investments in Serbian startups and will take a closer look at funding options available as well as investors active in the market. New funding schemes and platforms will also be presented.
Funding overview
Investments in startups were basically nonexistent 5 years ago. After modest increases in funding volumes in 2014 and 2015, more significant volumes were invested in 2016 and again 2018.

This oscillating funding is both due to the availability of funding (see also the Innovation Fund) and the timing of investors entering the market and providing the funds.

Investments in ICOs were excluded, but it is worthwhile mentioning that in 2017 and 2018 a total of EUR 67 million was invested in this area.

According to a recent survey conducted by the Digital Serbia Initiative, almost 60% of startups that exist for two years have not obtained any financing. The survey further suggests that the average funding for startups that exist for up to two years is around TEUR 350k. In that respect, the survey is probably not representative of the entire ecosystem due to the startup definition criteria.

The majority of startups have not received any financing, and especially funding in the early stages is hard to get by.

There are no Angel investors in the market to fund a wide range of early stage projects which would lead to more diverse and better developed companies ready to receive follow-on financing.

Investment by industry/sector
Although there is a wide variety of startups, the funding focus is clearly on software development and B2B solutions. The five largest target groups account for over 75% of funding received.
Active investors

There is a handful of investors active in the market, with each investor having its own investment scope and target. Investors are connected and co-invest on many occasions. In many cases startups do not qualify for an investment at a given time, but are being followed and supported and later on re-assessed when their development proves investment readiness. However, the depth and width of the investor base does not permit a wide range of startups across the various development stages and sectors to obtain funding.

INNOVATION FUND

Although already founded by decree on innovation activity in 2005, the Innovation Fund became only operational in 2011. It is located in the Science and Technology Park Belgrade and works under the supervision of the Government of Serbia and the Ministry of Education, Science and Technological Development. The fund’s goal is to improve the linkage between research and technology development and economy, as well as to encourage and support the development of innovative entrepreneurship.

The fund is supported by the European Union and the World Bank, but cooperates also with other organizations, donors and the private sector.

Since 2011, the fund received over 1,300 applications and financed about 350 projects with budgets totaling EUR 21.6 million through direct contributions of EUR 15.6 million.

For startups in early stages, the fund can provide financing in the form of grants, i.e. without pursing equity participation, through the following programs:

- **Mini Grants**: available for micro or small sized companies for the development of technological innovations; Financing up to TEUR 80 covering up to 85% of the total project budget
- **Matching Grants**: available for SMEs to translate research into commercially viable products Financing up to TEUR 300 covering up to 60% or 70% of the total project budget
- **Collaborative Grant Scheme Program**: available to SMEs and R&D to support joint initiatives to develop new commercially applicable intellectual property Financing up to TEUR 300 covering up to 70% of the total project budget

Other financing tools of the Innovation Fund aimed at supporting and linking SMEs and research include the ‘Innovation Vouchers’ (up to TEUR 7 covering up to 80% of total costs) and the ‘Technology Transfer Facility’ (up to TEUR 50 for academic R&D).

The Mini Grants and Matching Grants programs were initially launched through the Innovation Serbia Project in the period from 2011 to 2016, which was administered by the World Bank and financed by the EU with EUR 7.1 million (out of which EUR 5.6 million were attributed to the 2 grant schemes). During this period, the fund re-
ceived 341 applications for the mini grants and 119 applications for the matching grants. Under the mini grants, 41 projects were financed with ca. EUR 3.1 million, while the matching grants awarded 11 projects with EUR 2.5 million.

With primary funding coming from the EU after inception, it should be noted that the Innovation Fund was not in the position to award further mini or matching grants until the end of the Innovation Serbia Project in 2016 due to lack of funding from the Republic of Serbia.

However, both programs (together with the Collaborative Grant Scheme, Technology Transfer Facility and Innovation Vouchers) were then continued under the ‘Competitiveness and Jobs Project’ receiving financing of ca. EUR 14 million for the period 2017 to 2021 directly from the Ministry of Education, Science and Technological Development.

The continuation of the grant programs was well perceived as the fund received 280 mini grant applications and 175 applications for matching grants over the last 2 years.

33 mini grants were awarded for a total EUR 2.5 million with an average grant volume of ca. TEUR 75. The 14 matching grants obtained a total of EUR 3.0 million, averaging TEUR 215k per grant.

The Collaborative Grant Scheme awarded 14 projects with EUR 3.0 million in 2016. Note that the second call closed in December 2018 and led to 67 applications.

To this date, the three major grant programs provided funding of EUR 14.0 million for 61 projects across various industries.

ICT and software development stand out with a combined share of 31%. It is noteworthy, that other areas such as electrical and mechanical engineering, energy, environment and medtech receive a fair share of funding.
STARTLABS

StartLabs is a U.S.-based fund, with offices in San Francisco and Belgrade, established in 2013 with a focus on early-stage seed investments in startups from Southeast Europe.

Besides funding, startups obtain mentorship, office space, technical infrastructure, business services and networking to help startups turning ideas into sustainable businesses.

For the early stage, StartLabs offers up to TUSD 50 (TEUR 44) seed investment in return for 10-15% of equity stake in the company. Startups take part in a 6-month program, but obtain also additional help subsequently as needed. The fund offers a wide network of mentors to shape ideas and execute them, gain traction and raise more funding.

Over the years, the fund has been investing close to EUR 0.5 million in 17 deals since 2013. 10 deals were co-funded with other investors and 8 deals had multiple investment rounds.

Given the early, i.e. pre-seed nature of the investments, investments rarely exceed the prescribed target of TEUR 44 (the average is just slightly above TEUR 26k), but on occasion have also been higher.

StartLabs has been engaged in hundreds of conversations with founders each year, however, the gap between idea presentation to lead to actual investment is quite big, with only a few investments materializing each year.

The fund has been investing in the region, but with a strong focus on the Serbian market. 9 local startups received investments totaling TEUR 250. In addition, 4 startups from Slovenia, 2 from Croatia, and 1 each from Montenegro and the U.S. obtained funds from the remaining TEUR 200.

An overview of the investments is presented in Appendix I: Deal tables.
A glance at the startup ecosystem in Serbia
Belgrade / March 2019

SOUTH CENTRAL VENTURES

South Central Ventures is a regional closed-end fund with offices in Belgrade, Zagreb and Skopje established in 2015. It manages the Enterprise Innovation Fund (ENIF) which was established as part of the EU’s Western Balkans Enterprise Development & Innovation Facility (WB EDIF) aiming at improving access to finance for small and medium-sized enterprises (SMEs) in the Western Balkans.

Investors into ENIF are the European Commission (EC), European Investment Fund (EIF), European Bank for Reconstruction and Development (EBRD), Kreditanstalt für Wiederaufbau (KfW) together with institutional and private investors from the Western Balkans. ENIF also includes investments from the beneficiary economies of the Western Balkans (note that the Republic of Serbia participated in the fund with a contribution of EUR 1.3 million invested through the Innovation Fund).

The fund is focused on tech companies in the Balkans and has EUR 40 million available for investments dedicated primarily to seed stage and growth investments. Investments in the seed stage are planned with a special allocation of EUR 1.5 million for investments of up to TEUR 100 per company. The majority of the fund is allocated for growth investments of up to EUR 3 million per company. These investments are aimed to enable international expansion and further growth of the tech startups which have already gained traction and have proven their potential. The investments usually take 10-20% in equity of the startup.

Since the first investment in 2016, SVC’s portfolio has grown to 22 companies with total investments of EUR 16.6 million across various stages and sectors (note, that some deal details have not been disclosed). 5 startups received a follow-on financing. The average investment per startup amounts to ca. TEUR 870.

The data provided shows that the fund has received increasing interest after inception, with steady growth of potential investment opportunities each year reaching a new high in 2018 with almost 500 leads.

Actual investments made, however, represent only a fraction of the conversations the fund engaged into and is rather steady around 2% each year. This is in line with conversion rates seen from international comparisons.

Due to the regional focus of the fund, investments have been made across various markets, however, Albania, Bosnia and Hercegovina and Kosovo have yet to see funding for a startup.

Serbia is a significant market for South Central Ventures as it received about 50% of funds invested (ca. EUR 8.6 million) across 10 local startups.

Given that South Central Ventures is in the 4th year of operation and investments, with about 50% of the funds deployed, it is more likely that the fund will put a stronger emphasis on follow-on financing and less on early stage support.

An overview of the investments is presented in Appendix I: Deal tables.
NEW INVESTOR INITIATIVES

ICT Hub Ventures

ICT Hub Ventures is a million-euro fund set up by seven businessmen from Serbia in early 2017 to invest in tech startups in an early stage. The fund has an initial lifetime until the end of 2019 and aims to fund up to 20 projects.

Investments are up to TEUR 50 for 5-15% of ownership, while the startup is also part of an education and mentorship program aimed at developing and growing the business.

ICT Hub Ventures invests in pre-seed stages, in ideas with a technical solution and a clear B2B focus. If startups are not incorporated before they enter the program, it is a requirement to be registered in Serbia before any funds are obtained.

Since inception, the venture had four calls for investment that triggered around 40 applications per call, or about 160 applications to date. Investment opportunities come also from referrals out of the own hub, the wider network or from companies attending events. In 2018 alone, the team meet over 300 startups from the region, but with the majority coming from Belgrade or Novi Sad.

Up until today, the fund invested in 9 companies, out of which 7 are alive, while 2 startups closed down due to inability to validate the idea or problems within the team. Average investment volume is TEUR 30 for a 10% share in equity. This leaves room to invest in 11 targets this year to round out the portfolio.

Impact Hub’s Venture Growth Accelerator

Equipped with the experience of the startup programs and observations in the ecosystem, Impact Hub decided to launch some sort of Angel fund for early stage, i.e. pre-seed, investments together with the early stage investor ‘Wise Guys’ from Estonia in 2018. Selected startups receive up to TEUR 50 for 7% of ownership.

Of the overall investment, TEUR 20 is direct cash, while the remainder is an in-kind contribution for seminars, mentoring, roadshows, etc. Over the course of six months, selected startups will go through specific sales and business trainings, learn from international mentors with the aim to be ready for second round investments.

The focus is on scalable solutions in the areas of agri-tech, education/culture, social networks, clean energy and sustainable technology, blockchain, AI, etc.

The target of 5 investments per year is rather conservative, while interest and demand are rather high with over 100 applications after launching the fund. So far, 1 investment has been made.
OTHER FUNDS ACTIVE IN THE MARKET

Eleven Ventures

Eleven Ventures has been one of the first funds from the region to invest in Serbian startups. Given that the ecosystem in Bulgaria was also rather small and underdeveloped at the time, it was natural for the fund to have a regional focus and to invest in the neighboring markets.

Initially founded in 2012 in Bulgaria, Eleven Ventures is a pre-seed and seed fund with a focus on startups from South East Europe. The fund was set up as a closed-end fund (10 years) with funding from the European Investment Fund. The mandate was to deploy EUR 12 million to startups in the acceleration phase and to target about 200 investments with individual funding in the range of TEUR 25 to 200 for an equity stake of 5-20%.

Throughout the investment cycle, close to 120 projects were funded, while only 2 exits were later successfully arranged.

Until 2015, the fund invested just over EUR 1 million in 14 startups from Serbia in their early development stages (note that the investment overview exhibits only publicly available information). It is worthwhile noting, that half of these startups have gone through Startit’s Startup Academy.

The average investment volume was TEUR 375 for an average equity stake of 8%. The deal flow started after the initial investment was arranged in 2012, i.e. the year of inception, and was rather stable over the following years.

Looking back on the investments made in the first round, Eleven Ventures admits, that a large portion of the companies that were backed were not capable of surviving, which reflects on the readiness of the ecosystem, and the learning curve for the fund and the startups alike.

Today, the fund is connected to 300+ mentors and 300+ startup founders from more than 20 countries. Eleven Ventures recently closed a second fund, which is entirely privately funded. The new capacity is EUR 6 million and the investment focus is on pre-seed and seed stage. This forms a portfolio of up to 30 startups with individual investments in the range of TEUR 100-300 for 5-15% in equity, and creates the opportunity for follow-on financing of TEUR 500+ for selected companies. Given the investment history, it is very likely that some of these funds will benefit Serbian startups as well.

An overview of the investments in Serbia is presented in Appendix I: Deal tables.
OTHER REGIONAL FUNDS

Startups in Serbia have been benefitting from external funding sources in the past and it is expected that investments will also occur in the future from other investors abroad. Besides the second fund established by Eleven Ventures, who already have an established network and cooperation with the local ecosystem, other markets have recently obtained additional funding to support small and medium businesses.

The European Investment Fund (EIF) together with the Development and Export Bank of Croatia (HBOR) are launching now a EUR 70 million investment program to support fast-growing SMEs and mid-caps in Croatia. It comes in addition to the Croatian Venture Capital Initiative which was established in 2018 and is based on a funding agreement between the EIF and the Government of Croatia. The available funds of EUR 35 million will be invested through a VC set-up, including an accelerator, for seed stage investments.

It can be expected that these funds will be observing the wider region for potential investments, given similar limitations of the Croatian ecosystem and readiness of local startups to receive financing.

CROWDFUNDING AS A SOURCE OF FINANCING

Crowdfunding is in basic terms the funding of a project, idea or venture raising small amounts of money from a large number of people, usually through specific platforms on the internet.

There are in general four models for crowdfunding: donations-based, reward-based, lending-based and equity. However, only one of the aforementioned forms exists in Serbia. Since 2013, donations can be managed through the local crowdfunding platform ‘donacija.rs’. The platform has seen an increase in use and acceptance over the years, from ca. TEUR 570 donated in the period from 2013 to 2016, to ca. TEUR 610 in 2017 alone.

But as the name suggests, this is not a source of funding for startups. For any of the other 3 sources of financing in the crowdfunding space, startups turn to widely accepted platforms such as ‘indiegogo’, ‘kickstarter’, ‘crowdcube’ or ‘funderbeam’, to mention a few. And these platforms have indeed been used by local startups to obtain financing.

According to data available, mainly indiegogo and kickstarter were used by companies in Serbia for financing. In 2015 and 2016 only TEUR 100 were raised, but funding significantly increased to over TEUR 600 in 2017 (including also the then established platform Katana)²⁷. These figures may not include all projects that received funding from abroad, but it shows the potential and need for this type of financing. Similarly, it is also a good training for entrepreneurs with respect to sales and product marketing through these campaigns, as Serbian entrepreneurs show clear deficits in these areas.

A recent example is a financing round (equity) conducted by Strawberry energy on the investment platform crowdcube, in which the company collected over TEUR 410 (the initial target was TEUR 340) in September 2018 for the purpose of expanding the network smart benches in London from currently 30 to 100.

It is the latest round in a sequence of funding for Strawberry energy utilizing various sources to obtain financing which stands now at a total of ca. EUR 1.4 million. First funding came through grants, while the first equity investment was conducted with Eleven Ventures in 2014. Given that revenues then and now are not sufficient to carry the company, additional funding was obtained from various angel investors over the years, which were mainly discovered by the company. Crowdfunding helped Strawberry energy not only to obtain more funds than initially targeted, but to also increase awareness of the product and the company.

Given that Strawberry energy is also registered abroad, it makes the obvious point that local companies do not have access to these sources of financing. For lending-based or equity crowdfunding to work in Serbia, laws have to be changed.
Interestingly, the Estonian-based funderbeam, which provide a platform for startups in which investors trade shares as if the companies were listed on a stock exchange, was planning a market entry into Serbia. With the award as best fintech company in Europe in 2017 in the back pocket and after successfully establishing its platform in Croatia in cooperation with the local stock exchange in the year before, the idea was to establish a similar model with the Belgrade Stock Exchange. However, these plans had to be buried in 2018 due to the existing legal boundaries set for example by the National Bank of Serbia. This is a set-back for Serbian startups as the model proved to be successful in Croatia: funderbeam allocated over EUR 2 million from investors worldwide to four Croatian startups and SMEs in first ten months of 2017 alone²⁸.

In order to tackle regulatory issues around lending-based crowdfunding in Serbia and to help SMEs access other financing options besides the traditional sources of financing, USAID has mandated a project (which is currently being carried out) that analyzes the regulatory, legal and economic framework in Serbia and that will also make recommendations for implementing a crowdfunding lending platform.

It remains to be seen which crowdfunding model will be implemented in Serbia and when. The benefits for startups and other small and medium businesses to have direct access to funding are apparent.
It comes as no surprise to say that the startup ecosystem is still in the early stages. Still, because it has been developing for almost a decade, certainly with much more traction over the last couple of years, but basic elements to lift the ecosystem to the next level are still underdeveloped or missing.

The number of startups in the Serbian ecosystem is estimated to be somewhat north of 200. Particularly the IT sector drives the development as it provides an opportunity to engage in an industry with virtually no barriers to enter.

The ecosystem benefits from a large talent pool of highly educated and skilled software developers, mechanical and technical engineers, which together with the relatively low salaries and living costs in Serbia create a competitive advantage for startups here.

This should make for a great pitch with VCs, to fail fast and cheap, but financing is hard to get by and Serbia is for most internationally active VCs a white spot on the map. Some local startups received financing on their own initiatives abroad, but it has not led to significantly increased interest in the community and inflow of funds. Access to financing is an issue across all stages for local startups. There are no true Angel investors in the market to broaden the base for entrepreneurial activities. And even if startups have obtained some financing, follow-on funding is also very difficult to come by.

Local investors have not yet embraced these alternative investments. Those are high risk and investment schemes obviously differ from the common practice of investing in companies or real estate. Investor education and continuous efforts to create platforms for investments are needed to make local money available for local startups. One can conclude that the limitations in funding directly impact the diversity and depth of the ecosystem.

On the other hand, startups may not be ready for investment with respect to professionalism of presenting their ideas, conducting their businesses and market readiness of their solutions. In many cases, founders struggle early on to take the idea forward into a product and later on to market it. Many startups are lacking sales and marketing know-how to build the right approach for market segments and customers, in order to develop sustainable revenue streams. Incubators and investors pointed to this area as a main issue for startups, and startups generally confirmed it as well.

Hubs and incubators were engaged early on to provide a variety of programs and seminars to educate startups on business-related topics. However, it seems that these support systems are overlapping and competing at times over resources and startups. Some sort of
consolidation and coordination might be needed to better position each of the hubs and incubators and to align them in their mission to support founders. This may be another critical element to move the ecosystem forward.

Lastly, the ecosystem has yet to see that founders successfully exit their startups and re-enter the market either with a new venture or as investor. This generational effect that comes with new funds and an abundance of knowledge and experience will transform the ecosystem and accelerate the progress.

In addition to the aforementioned impediments, there are also significant systemic holdbacks. As anywhere else in the world, the ICT sector is moving at an incredible pace, shifting the landscape for consumers and businesses alike. However, local legislation and administration is bound by outdated structures and systems and unable to follow, let alone to support this development.

Existing laws provide obstacles for financing and international sales for local startups. The Serbian economy is not integrated in international financial markets making free flow of funds cross borders difficult. While investors are in the position to construct a solution to accommodate existing laws and regulations for financing purposes (if they are really interested to engage local), startups cannot count on using other sources of financing or sales platforms that are generally accepted worldwide. And in the end, customers anywhere are not willing to accommodate small market solutions that are slow and cumbersome; they will simply move on to another product or solution that is easier to use.

Introduction of new laws, such as the law on alternative investments, have to be finally concluded as it is vital for the local market, and startups in particular, to have access to alternative ways of financing. Bringing existing laws in line with EU regulation to allow, for instance, crowdfunding (conducted locally and internationally) for lending and equity-based financing would provide anyone with an idea to start a business with a new source of potential financing, without incorporating abroad or physically moving.

Furthermore, the administrative system is still slow, unconnected and paper-based. Initiatives to elevate e-government should be pushed. Corporate law has to be further adjusted to better address entrepreneurs together with incentives to start a company, to make change in ownership easier and to introduce commonly used methods for incentive and compensation such as employee stock options.

Besides, government, public entities and state-owned companies can play another vital role for the startup ecosystem. These entities have the potential to be the largest customer of innovations and solutions produced by startups. But for this to happen, public procurement needs to be altered dramatically to allow, for example, an idea or minimum viable product to be procured rather than a product, and to allow companies to enter the process without old-fashioned formal criteria that do not apply to startups.

Last but not least, failure from starting up a business should not be stigmatized, it should rather be seen as a valuable experience, by family, friends and business community alike. This is a very common trait embedded in the local culture and mentality. Equally, being from this region is taken as an excuse as to why one cannot succeed. A change in mindset is needed in both cases, together with a positive attitude and encouragement. The recent acquisitions of Serbian startups provide great examples and make the argument that building a successful company here can be done.
ABOUT THE GERMAN-SERBIAN CHAMBER OF COMMERCE AND THE AUTHOR

GERMAN-SERBIAN CHAMBER OF COMMERCE

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http://serbien.ahk.de

The German-Serbian Chamber of Commerce is part of a global network of 140 offices of German Chambers of Commerce Abroad and delegations of the German economy in 92 countries. With more than 350 member companies, it is the largest and one of the most important bilateral economic organizations in Serbia. It is the ideal platform for contacts between German, Serbian and international companies.

The German-Serbian Chamber of Commerce provides:

• Network of German and Serbian company representatives
• Representation of interests of member companies towards Serbian and German institutions
• Practical support for members and companies interested in doing business in Serbia
• Tailored services in the context of market development
• Promotion of dual vocational education in Serbia

Starting as a delegation of the German economy, the chamber has been present in Serbia since 2001.

CHRISTOPH BERNDT, CFA

Contact:
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https://strategy-map.net

Christoph is the founder and managing partner of Strategy MAP, a consultancy for corporate strategy and strategy implementation.

He has more than 12 years of experience in finance and management, as CEO, CFO, CRO and financial advisor to international companies. Christoph has profound knowledge in core transaction work such as M&A, valuations, purchase price allocation (PPA), post-merger integration (PMI), but excels also in other areas of corporate finance such as business planning and financial modeling as well as corporate restructuring and reorganization.

Christoph enjoyed various roles and responsibilities as consultant during his 9 years in KPMG and advised on project finance (conventional and renewable energy, infrastructure), data protection in the telecommunication industry, NPL resolution and banking sector reforms, as well as several cross-border acquisitions.

He recently worked as regional CFO and CRO for McCann Nordics ultimately responsible for over 230 employees.

Christoph has been engaged by the German-Serbian Chamber of Commerce in Serbia as Senior Advisor since November 2018.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APR</td>
<td>Agencije za privredne register</td>
</tr>
<tr>
<td>B2B</td>
<td>Business-to-business</td>
</tr>
<tr>
<td>B2C</td>
<td>Business-to-customer</td>
</tr>
<tr>
<td>BITF</td>
<td>Business Technology Incubator of the Technical Faculties Belgrade</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>COO</td>
<td>Chief Operating Officer</td>
</tr>
<tr>
<td>CTO</td>
<td>Chief Technology Officer</td>
</tr>
<tr>
<td>DaaS</td>
<td>Desktop-as-a-service</td>
</tr>
<tr>
<td>DSI</td>
<td>Digital Serbia Initiative</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>ENIF</td>
<td>Enterprise Innovation Fund</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EUR</td>
<td>Euro</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>EIF</td>
<td>European Investment Fund</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>ICO</td>
<td>Initial Coin Offering</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>ID</td>
<td>Identity document</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>KfW</td>
<td>Kreditanstalt für Wiederaufbau</td>
</tr>
<tr>
<td>KYC</td>
<td>Know-your-customer</td>
</tr>
<tr>
<td>MVP</td>
<td>Minimum Viable Product</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research &amp; Development</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software-as-a-service</td>
</tr>
<tr>
<td>SEE</td>
<td>South East Europe</td>
</tr>
<tr>
<td>SME</td>
<td>Small and medium enterprise</td>
</tr>
<tr>
<td>S&amp;P</td>
<td>Standard &amp; Poors</td>
</tr>
<tr>
<td>TEUR</td>
<td>Thousand Euros</td>
</tr>
<tr>
<td>TUSD</td>
<td>Thousand U.S. Dollars</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>U.S.</td>
<td>United States</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USD</td>
<td>U.S. Dollar</td>
</tr>
<tr>
<td>VC</td>
<td>Venture Capital</td>
</tr>
<tr>
<td>WB EDIF</td>
<td>Western Balkans Enterprise Development &amp; Innovation Facility</td>
</tr>
<tr>
<td>WP</td>
<td>WordPress</td>
</tr>
</tbody>
</table>
# Overview of StartLabs’ deals

<table>
<thead>
<tr>
<th>Startup</th>
<th>Description</th>
<th>Based</th>
<th>Funding year</th>
<th>Funding (€)</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>LegalTrek</td>
<td>Integrated legal practice management solution</td>
<td>Serbia</td>
<td>2013</td>
<td>10,400</td>
<td>n/a</td>
</tr>
<tr>
<td>CarLock</td>
<td>Advanced real-time car tracking &amp; alert system</td>
<td>Slovenia</td>
<td>2014 *</td>
<td>56,900</td>
<td>n/a</td>
</tr>
<tr>
<td>Loyalis</td>
<td>Smart loyalty program for e-commerce</td>
<td>Serbia</td>
<td>2014 *</td>
<td>43,350</td>
<td>n/a</td>
</tr>
<tr>
<td>WhoAPI</td>
<td>Application that turns raw domain data into machine readable outputs</td>
<td>Croatia</td>
<td>2015 *</td>
<td>46,700</td>
<td>n/a</td>
</tr>
<tr>
<td>Kidster</td>
<td>Web platform for buying and selling kids’ stuff</td>
<td>Serbia</td>
<td>2015 *</td>
<td>19,200</td>
<td>n/a</td>
</tr>
<tr>
<td>Mango</td>
<td>Mobile gaming platform</td>
<td>Serbia</td>
<td>2015 *</td>
<td>13,600</td>
<td>n/a</td>
</tr>
<tr>
<td>MobCon</td>
<td>Talkbook is a solution for public speakers to generate business leads</td>
<td>Croatia</td>
<td>2015 *</td>
<td>13,500</td>
<td>n/a</td>
</tr>
<tr>
<td>Swapp</td>
<td>App to swap unwanted items with other people</td>
<td>Montenegro</td>
<td>2015 *</td>
<td>14,000</td>
<td>n/a</td>
</tr>
<tr>
<td>Upgrass</td>
<td>Self-charging wireless keyboard using different energy harvesting technologies</td>
<td>Serbia</td>
<td>2015</td>
<td>4,700</td>
<td>n/a</td>
</tr>
<tr>
<td>WorkPuls</td>
<td>Productivity assessment tool for managers</td>
<td>Serbia</td>
<td>2016</td>
<td>39,300</td>
<td>n/a</td>
</tr>
<tr>
<td>Fragrance by Me</td>
<td>Create your own fragrance</td>
<td>Serbia</td>
<td>2016 *</td>
<td>35,150</td>
<td>n/a</td>
</tr>
<tr>
<td>BabyStork</td>
<td>App for tracking woman’s cycle and pregnancy planning</td>
<td>Slovenia</td>
<td>2016</td>
<td>13,400</td>
<td>n/a</td>
</tr>
<tr>
<td>FreshieTech</td>
<td>Orchard management system with personalized measures for the mobile</td>
<td>Serbia</td>
<td>2018</td>
<td>12,300</td>
<td>n/a</td>
</tr>
<tr>
<td>BlubBlub</td>
<td>App for children’s speech and language development and therapy</td>
<td>Slovenia</td>
<td>2018</td>
<td>20,200</td>
<td>n/a</td>
</tr>
<tr>
<td>Melon &amp; Lime</td>
<td>Yoga mats connected to app</td>
<td>Slovenia</td>
<td>2018</td>
<td>9,900</td>
<td>n/a</td>
</tr>
<tr>
<td>Agremo</td>
<td>Cloud-based software platform for agribusinesses</td>
<td>Serbia</td>
<td>2018</td>
<td>75,000</td>
<td>n/a</td>
</tr>
<tr>
<td>YCrib</td>
<td>A members-only hotel for entrepreneurs and creatives</td>
<td>USA</td>
<td>2018</td>
<td>26,400</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Note: Equity participation information was not available; * denotes several funding rounds
## Overview of South Central Ventures’ deals

<table>
<thead>
<tr>
<th>Startup</th>
<th>Description</th>
<th>Based</th>
<th>Funding year</th>
<th>Funding (€)</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>VetCloud</td>
<td>Software solution for the veterinary industry</td>
<td>Niš</td>
<td>2012</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Wolleek</td>
<td>Web application for beekeepers</td>
<td>Novi Sad</td>
<td>2013</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>LegalTrek</td>
<td>Integrated legal practice management solution</td>
<td>Niš/Novi Sad</td>
<td>2013</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>DataMaid</td>
<td>Cloud storage organizer for bloggers and journalists</td>
<td>Belgrade</td>
<td>2013</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Xenodo</td>
<td>Task and project management tool for Gmail</td>
<td>Novi Sad</td>
<td>2013</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Farmia</td>
<td>Web marketplace for livestock</td>
<td>Belgrade</td>
<td>2013</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Content Insights</td>
<td>Web analytics service for valorizing texts in online media</td>
<td>Novi Sad</td>
<td>2014</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Block: A Boat</td>
<td>Mobile and web app for booking transportation via different kind of boats</td>
<td>Belgrade</td>
<td>2014</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Coprix Media</td>
<td>Development of content for digital and interactive classrooms</td>
<td>Belgrade</td>
<td>2014</td>
<td>100,000</td>
<td>n/a</td>
</tr>
<tr>
<td>Cyber City</td>
<td>Platform for artists, hobbyists and creators to sell their works</td>
<td>Belgrade</td>
<td>2014</td>
<td>25,000</td>
<td>8%</td>
</tr>
<tr>
<td>Strawberry energy</td>
<td>Development of green and smart urban devices to provide people with charging, connectivity and local information in public spaces</td>
<td>Belgrade</td>
<td>2014</td>
<td>100,000</td>
<td>6-12%</td>
</tr>
<tr>
<td>McBrainTrain</td>
<td>Development of wearables for recording and analyzing electrical brain activity</td>
<td>Belgrade</td>
<td>2015</td>
<td>50,000</td>
<td>n/a</td>
</tr>
<tr>
<td>EuroPATC</td>
<td>Development of wearables to protect children with autism</td>
<td>Niš</td>
<td>2015</td>
<td>25,000</td>
<td>n/a</td>
</tr>
<tr>
<td>BinCode</td>
<td>Role playing game based on Slavic mythology for mobiles</td>
<td>Belgrade</td>
<td>2015</td>
<td>25,000</td>
<td>8%</td>
</tr>
</tbody>
</table>

## Overview of Eleven Ventures’ deals in Serbia

<table>
<thead>
<tr>
<th>Startup (Undisclosed)</th>
<th>Description</th>
<th>Based</th>
<th>Funding year</th>
<th>Funding (€)</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company (Undisclosed)</td>
<td>n/a</td>
<td>Macedonia</td>
<td>2018</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Om3ga</td>
<td>Daktilograf is a speech-to-text converter for Slavic languages</td>
<td>Montenegro</td>
<td>2019</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>
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12. ICT in Serbia, at a glance 2018, Vojvodina ICT cluster
14. Sito, data on ICT education and labor market, 2019
15. Sito, data on ICT education and labor market, 2019
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18. https://www.f6s.com/startups?search=[%22context%22:%22and%22,%22rules%22:[{%22filter%22:%22location%22:%22operator%22:%22eq%22,%22value%22:{%22type%22:%22country%22,%22object_id%22:190,%22country_id%22:190}}]]&ss=1&sort=popularity&sort_dir=desc&all_startups=1&columns[]=markets&columns[]=location&columns[]=founders&columns[]=founded
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