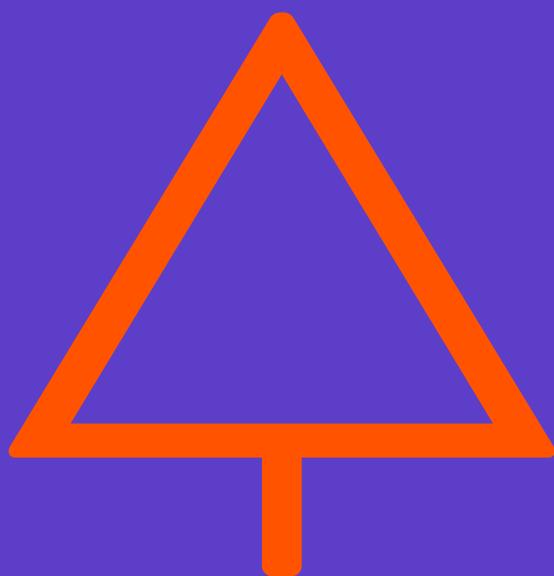


Startup Estonia White Paper 2021-2027



Authors:
Sten-Kristian Saluveer
Maarika Truu

July 2020

A foreword from the authors: A small country on course to a global startup mindset

In 2003, when four Estonian programmers in Tallinn backed by a duo of Scandinavian serial entrepreneurs released the first version of VOIP software that came to be known as **Skype**, nobody could have anticipated the scale of the impact for the small country of Estonia. Before that moment, Estonia had already been transforming digital for almost a decade ¹, and so this was a pivotal moment. The skyrocketing success of Skype with exits to eBay and Microsoft sparked a wave of first and second generation “Skypers” founding and steering their startups to victory, setting an example for future founders to follow. Fuelled by the Estonian spirit of inventiveness, enabling smart policy and infrastructure decisions such as the digitalisation of government services and e-residency ², plus investments both homegrown and international, two decades later Estonia is a startup nation, a destination and a home to global unicorns including **Bolt** ³ and **Transferwise**. ⁴

Startup Estonia was initiated in 2015 by an executive order of the Minister of Entrepreneurship to draw from the successes of Estonian flagship startups and support the transformation from one-shot successes towards a fully-fledged startup ecosystem. Over these five years, Startup Estonia, devised initially as a support mechanism for disseminating European structural funds (2014-2020) to boost startup-focused initiatives, has

evolved into a platform set to make Estonia one of the world’s best places for startups, partnering with and uniting the best startups, incubators and accelerators in the private and public sector.

Through various programmes, Startup Estonia⁵ aims to strengthen the Estonian startup ecosystem, support and enable training programmes for startups, educate local investors and promote foreign investments in Estonian startups, solve regulative issues and barriers, monitor vital indicators, and oversee and implement the Startup Visa for global founders and talent. As of the end of 2019, Estonia is home to four unicorns, 900 registered startups with approximately 6,000 employees, paying more than €75 million euros in annual workforce taxes, and annually attracting a healthy €266 million euros in foreign investments. For a country and economy of 1.3 million inhabitants, these are humble yet significant beginnings.

In 2021, Startup Estonia will be entering its sophomore edition with a fresh set of ambitious goals for our small yet vibrant ecosystem and its impact on Estonia as a country. Over a year, we have been looking inside and outside, seeking feedback and debating with local and international founders, investors, ecosystem builders, and policymakers.

¹ <https://e-estonia.com>

² <https://e-resident.gov.ee>

³ <https://techcrunch.com/2020/05/26/bolt-the-european-on-demand-transport-company-raises-109m-on-a-1-9b-valuation/>

⁴ <https://techcrunch.com/2020/07/28/transferwise-five-unicorns/>

⁵ <https://startupestonia.ee>

We had to evaluate how and to what extent the Estonian startup ecosystem contributes to the country as a whole, and what is, and should be its global positioning and unique offering. We also went back to basics to define the core terms and definitions for all ecosystem players for clarity in language, goals, and understanding. As a result, the Startup Estonia strategy and action plan was created, which we are pleased to present to you in this white paper.

Our strategy for 2021–2027 centres around the importance of an all-inclusive startup mindset, making this ubiquitous throughout the business and public sector and society – making this our unique offering in the world. We are set to promote a locally global startup mindset across all stages, encourage the step up from science/inventiveness to creating more startups and competitive scaleups, ensure all hands-on and all-inclusive opportunities, and establish open and data-driven steering and foresight for the startup community.

We thank everyone who contributed to the creation of the Startup Estonia strategy 2021-2027, and above all, the founders and doers hoping to kickstart the conversation about the future of Startup Estonia, the Estonian startup ecosystem and startup innovation at large.



Maarika Truu



Sten-Kristian Saluveer

Table of Contents

Key enablers for Estonia's startup success	5
25 years of Estonian Startup History at a Glance	6
Key Ecosystem Organizations	10
Terms and Concepts and our Interpretation	11
Startup Estonia in a Nutshell	12
What have we achieved in the past five years?	13
What we need to improve	14
How the Estonian Startup Ecosystem sees itself	16
What is happening to the startup ecosystems globally?	16
Statup Estonia Vision & Action Plan 2021-2027	19
Our Strategic priorities	20
Additional Graphs & Statistics	28
About the Authors	31
The Authors Thank	32

Key enablers for Estonia's startup success

- 01 High-quality local talent and education**

Estonia frequently ranks high in international education benchmarks such as the PISA tests. ⁶
- 02 Favourable economic and business climate**

Estonia has relatively low bureaucracy, a fully digital business infrastructure (including company founding, banking, digital contracts, and taxation) and a flat tax system, allowing companies to reinvest their profits tax-free, except for distributed dividends that have to be taxed at the corporate income tax rate. ⁷
- 03 Public sector innovation**

Estonia has a strong history of publicly driven innovation, including the development of the E-state, X-Road infrastructure, e-Residency, and most recently, the Accelerate Estonia "moonshot lab" programmes. ⁸
- 04 Global "testbed" mindset**

Due to our small domestic market of 1.3 million customers and a "let's do it mindset" Estonia has been an excellent testbed for innovations and startups prior to going global. ⁹
- 05 Close knit community and founder to founder approach**

Estonia's startup community is down to earth yet vibrant, with superhero founders supporting and inspiring newcomers whether through hands-on mentoring, investments, or co-founding new startups.

⁶ <https://www.hm.ee/en/activities/statistics-and-analysis/pisa>

⁷ <https://investinestonia.com/business-in-estonia/>

⁸ <https://accelerateestonia.ee/en/>

⁹ Recent example being the KrattAI. #KrattAI will be an interoperable network of public sector AI applications (agents, bots, assistants, etc) as well as private sector apps, working from the user perspective as a single, united channel for accessing direct public services and public information. Alternatively, you can call #KrattAI an ecosystem of interoperable AI applications to provide or access digital public services. <https://www.kratid.ee/in-english>

25 years of Estonian Startup History at a Glance



2006

Public Sector

Arengufond (Development Fund)

Community & Ecosystem

Ajujaht (Brain Hunt)

Largest competition of business ideas
initiated by Enterprise Estonia

Superhero Startups

Fortumo

2007

Community & Ecosystem

Startup Leaders Club (SLC)

By first and second generation
of superhero founders

Superhero Startups

Grabcad

Zeroturnaround

Investors

**Estonian Private Equity and Venture
Capital Association (EstVCA)**

2009

Community & Ecosystem

Garage48

Global hackathon platform with more than
190 hackathons in 26 countries

Community & Ecosystem

Garage48 HUB

First co-working space in Estonia

Superhero Startups

Pipedrive

2010

Public Sector

**Startup Estonia first pilot activities
under Enterprise Estonia**

Superhero Startups

Transferwise

2011

Investors
Estonian Business Angels Network (EstBan)

Community & Ecosystem
Crowdsourced Estonian Startup funding spreadsheet

Latitude59
 Flagship startup and tech event

Investors
Startup Wise Guys

2012

Superhero Startups
Bolt (formerly Taxify)
FunderBeam
Lingvist

Investors
Baltic Innovation Fund
 Fund-of-funds for later stage investments

2013

Public Sector
E-Residency
 Opens Estonia's digital infrastructure to global entrepreneurs

Public Sector
Startup Estonia
 Programme launches (EU SF period 2014-2020)

Superhero Startups
Starship Technologies
COMODULE

2014

Superhero Startups
Monese
Veriff
+350 Startups

2015

Superhero Startups
SaleMove
eAgronom
+408 Startups

Investors
EstFund

Fund-of-funds, focusing on equity investments into innovative and high growth-focussed enterprises Estonia

2016

Public Sector
Startup Visa

Superhero Startups
Seguru
MeetFrank
Fractory
+500 Startups

Investors
SuperAngel

Accelerator fund supported by SmartCap and Startup Estonia

2017

Superhero Startups
Klaus
OriginalMY
Salv
+550 Startups

2018

Public Sector
Estonian Startup Database
Accelerate Estonia

Startup minded agile public sector accelerator

Superhero Startups
+900 Startups

2019



Graph 1: #Estonianmafia Wall of Fame in LIFT99.

Criteria for startups to get on the wall of fame: 80-100% revenue growth per year, 3M+ € annual revenue and/or 5M+ € funding, 100 000+ € taxes paid to Estonian Government per year.

Key Ecosystem Organizations

Accelerators/Incubators

Alpine House, CleanTech ForEst Climate KIC, ESA Business Incubator Centre, Tehnopol Startup Incubator, Startup Wise Guys, Storytek, Tallinn Creative Incubator, Tartu Biotechnology Park, Tartu Science Park, Prototron, Ajujaht, Elevator Startups, TalTech Mektory

Conferences & Community

Latitude59, sTARTUp Day, North Star AI, Lift99, Garage48, Robotex, Forwardspace, Palo Alto Club, Spring Hub, Vivistop, Future Heroes, Hüppelaud, Techsisters, Digigirls

Investors

EstBan, Contriiber Ventures, Change Ventures, Fundwise, Funderbeam, Karma VC, Lemonade Stand, Estonian Research Council, SEB Bank, Spring Capital, Superangel, Tera Ventures, Thorgate Ventures, Trind VC, United Angels, United Partners, Nordic Ninja

Terms and Concepts and our Interpretation

The following terms and definitions are used throughout the Startup Estonia strategy and white paper.

Business angel - a wealthy individual with business experience investing in the early-stage or seed round of a startup, usually within a sector or field

Exit - Generally, exit refers to the withdrawal of an investor from a startup in the most beneficial way for the investor.

Moonshot mindset – an approach to solving an immense challenge or a problem facing the whole society, and finding a breakthrough using a radical or previously untested approach, process, scientific discovery or technology.

Startup - is a business entity (up to and including 10 years of operational history) belonging to a company registered in Estonia, which is starting activity with the purpose of developing and launching a business model or technological component with high global growth potential, that is innovative and replicable and shall significantly contribute to the development of the Estonian business environment. ¹⁰

Startup ecosystem - the field and network of all participants related to startup entrepreneurship, which in sum impacts the development performance of startups and startup entrepreneurship in Estonia.

Startup mindset - is an approach based on the cycle “Build, validate, learn” drawing heavily from creativity, flexibility, and entrepreneurialism; it drives the rapid execution of ideas and learning from results.

Startup sector - an economic sector consisting of startups founded, incorporated, and or doing business in Estonia.

Scaleup - a startup that has raised investments of at least 1 million euros, has at least ten registered employees and has an annual growth in employees and turnover of at least 20% within three years.

STEAM education - educational approach to learning using science, technology, engineering, design, and mathematics.

Unicorn - a rapidly scaling startup with a market capitalisation of over 1 billion euros.

¹⁰ In accordance to Estonian Alien's Act: <https://www.riigiteataja.ee/en/eli/ee/518112013013/consolide/current>

Startup Estonia in a Nutshell

Startup Estonia was initiated in 2015 by the executive order of the Minister of Entrepreneurship with the goal of establishing the Estonian startup ecosystem through various grants and community facing funding schemes between 2014–2020.

Today, Startup Estonia serves as the main supporter and enabler of the Estonian startup community, mediating between founders, ecosystem members and the governance and public sector. It is also the international representative of Estonian public sector driven startup initiatives.

The Startup Visa

<https://startupestonia.ee/visa/>

The Estonian Startup Visa programme, initiated by Startup Estonia in 2017, helps non-EU founders grow their startup in Estonia, and also facilitates Estonian startups in the process of hiring non-EU talent.

In the past three years over 2,000 individuals from over 80 countries have successfully passed the application assessed by the Startup Committee consisting of key Estonian startup community stakeholders.

Since the programme's launch, 500 founders have

relocated to Estonia including from Russia, India, Turkey, Ukraine, Iran, Pakistan and Egypt.

Altogether 1,351 employees have relocated to Estonia to work in Estonian-based startups. In 2019, the top 5 countries that were represented in the visa and temporary residence statistics were Russia, Brazil, Ukraine, India and Iran. Altogether, 701 people received the visa or temporary residence permit to relocate to Estonia in 2019, which is significant growth from 483 in 2018 and 167 in 2017.

Startup Estonia's four core areas of activity

- 01** **Strengthening the Estonian startup ecosystem** – uniting and building the community through different events and activities, creating and executing unified marketing and branding strategies and providing funding for community initiatives.
- 02** **Training startups and ecosystem members in areas they currently lack expertise in** that keeps them from achieving their (international) business goals.
- 03** **Educating local investors to help them invest more and smarter**, help attract foreign investors to Estonia, and kickstart new accelerator funds in order to bring more smart money into the local ecosystem.
- 04** **Eliminating regulatory issues and barriers** that complicate the process of operating a startup, investing in startups or raising funding in Estonia, and ensuring there is a startup-friendly environment through means like the Startup Visa.

What have we achieved in the past five years?

Due to the success of Startup Estonia, the functioning flagship startups, founders, and community organisations, as well as the minimal bureaucracy and startup-friendly business environment, a small yet vibrant and internationally visible and attractive Estonian startup ecosystem has lifted off.

The Estonian startup ecosystem consists of more than 100 organizations with offerings for all stages of the startup life-cycle, starting from innovation and entrepreneurship education for children to investments and business services tailored to scaleups.

The startup sector is the fastest-growing economic sector in Estonia with annual employment growth of 30% on average.

By the end of 2019, Estonia has 900 registered startups (per 1.3 million residents), making a significant contribution to the country's economy by employing ~6,000 and paying more than €75 million in employment taxes per year.

Foreign investments in Estonian startups are steadily increasing with a record-breaking €328 million invested in 2018, and €266.4 million invested in 2019.

Estonia has given birth to four unicorns in the past fifteen years (Skype, Playtech, Transferwise, and Bolt), and ranks third in Europe in terms of the highest number of startups per capita. Bolt, the Estonian ride-share platform, was recently named the hottest European unicorn at the Europas awards.¹¹

International talent and e-residents see Estonia as an attractive work destination. As of 2019, 22% of employees in Estonian startups are foreign nationals, and the Startup Visa has enabled the relocation of more than 2,000 founders and startup employees.

Many Estonian startups such as Transferwise, Bolt, and Skype have become globally recognised brands, and startups are an indispensable part of Estonia's international relations.

¹¹ <https://techcrunch.com/2020/06/26/here-are-the-winners-of-the-europas-awards-2020-even-a-pandemic-cant-stop-these-startups/>

What we need to improve?

The decision-makers have not systematically addressed startups and the startup sector as a country-wide, cross-sectorial and cross-discipline critical development priority. The collection, analysis and implementation of real-time, market-driven data to steer startup and ecosystem focused policy is at an early stage.

The startup community has been lukewarm in its response to long-term proposals, strategies, and actions by the public sector while being strongly dependent on the legal environment and public sector supported projects and grants, especially for community organisations and service providers.

Estonian startups need talent and urgently – the demand in the startup sector exceeds what the market and the education system offers; a STEAM-driven approach is not widely implemented in universities and higher education institutions.

Legal complexity constrains the growth of foreign investments, domestic investments are angel driven and focused on the early stage of the startup life-cycle, with the majority of local investors with short term experience and fragmented portfolios.

Exits are rare and mysterious – Estonian corporations and enterprises are still slow to adopt innovations, especially from startups. Estonia also has a long road

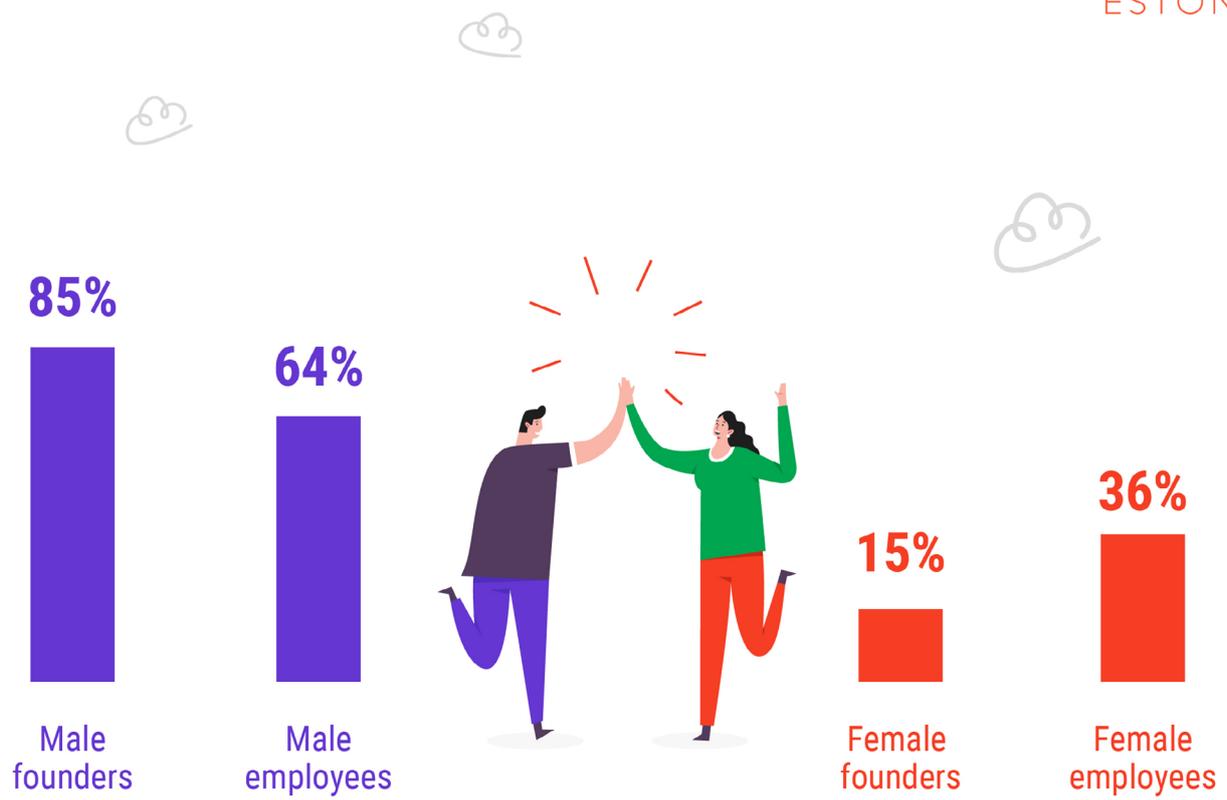
ahead in harnessing innovation spillover from universities and science producing organisations, R&D and science to prototype to startup and tech transfer commercialisation. Science, deep tech or creative vertical success stories are still hard to come by. The European Innovation Scoreboard says, “Estonia shows the highest positive difference to the EU in Total Entrepreneurial Activity, Average annual change in GDP and FDI net inflows, and the biggest negative difference in Top R&D spending enterprises.”¹²

Successful startups depart Estonia to more attractive destinations, mostly due to access to increased market, capital, or talents. Estonia lags in offering competitive business development and relocation services for sustainable growth in foreign founder-driven startups or other highly sought after and skilled talents.

The Estonian startup ecosystem should be more diverse, as much of the startup and startup related business (95%) is concentrated around the major cities of Tallinn and Tartu and despite regional interest, the capacity to support entrepreneurship and startup businesses is low. Similarly, the ecosystem could benefit from a more diverse set of founders in terms of gender, age, and culture. While most of the founders are male, many of the highly-skilled startup employees in Estonia are women.¹³

¹² https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en

¹³ <https://media.voog.com/0000/0037/5345/files/ESTaas.pdf>

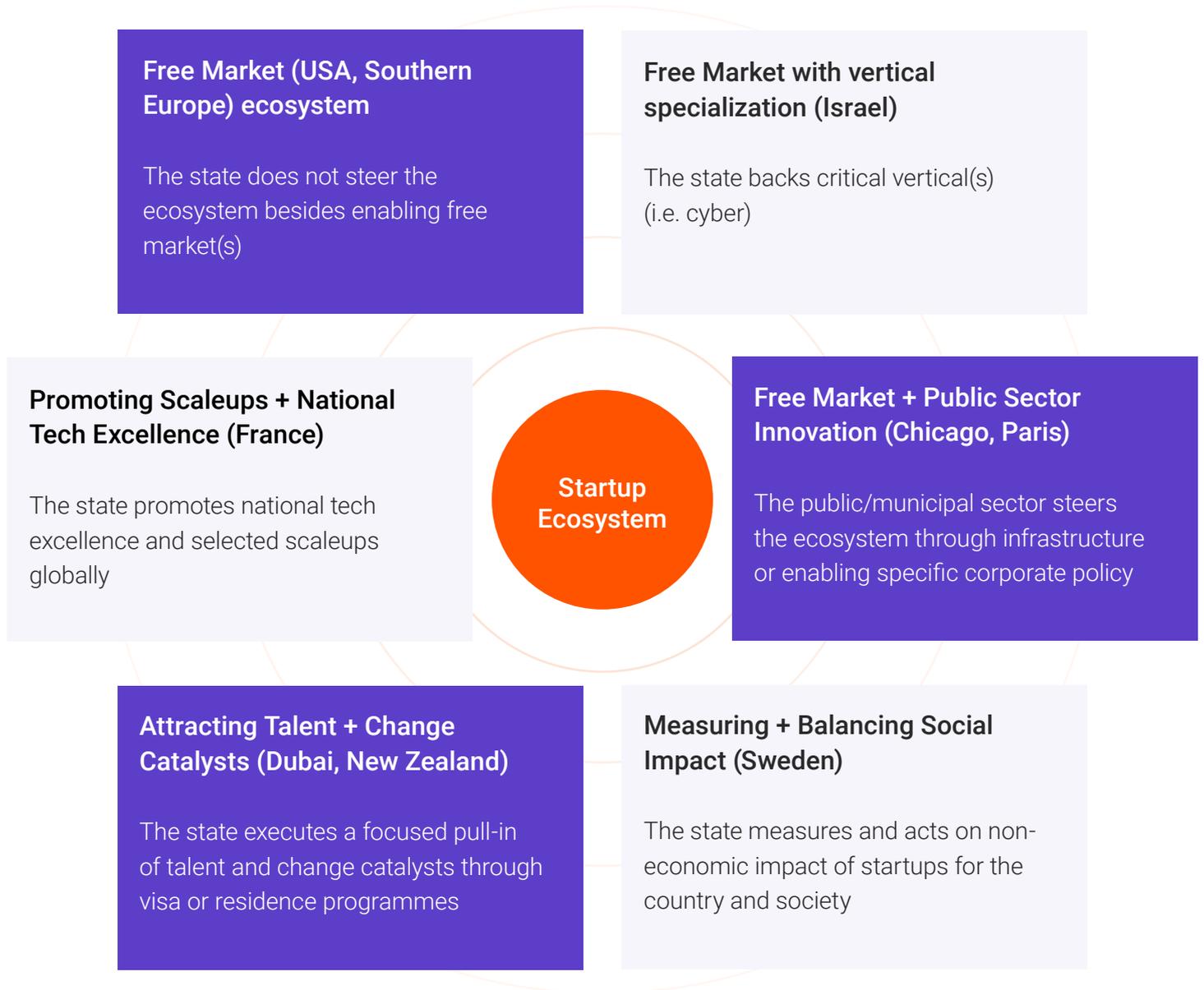


Graph 2: Proportion of male and female employees and founders in startup sector.
Source: Startup Estonia statistics. Calculations are based on Statistics Estonia data.

- 02 The world is not (exclusively) Silicon Valley Centric – startup ecosystem hotspots are emerging across the globe with unique characteristics and unique competitive advantages.
- 03 The role (and the need) for public sector or government-driven initiatives varies immensely across ecosystems. It may yield minimal intervention and high corporate involvement (US, Italy, Southern Europe) or focus on national tech excellence and scaleups (La French Tech). Or it may stress creating hubs of innovation and world-class talent (Dubai, New Zealand), or managing the social impact of the startup and innovation sector for society (Sweden).
- 04 Vertical specialisation draws from specific local components and resources such as talent specialisation, unique science and R&D capacity, and other locally unique properties. Verticals emerge due to the needs and goals of the ecosystem as a whole, and the transfer of knowledge, skills, and experience between experienced and up and coming founders. Therefore, the role of governance is supportive of ecosystem development and not prescriptive in terms of policy or regulation.
- 05 It's a long-term, second generation game based on trust. Today's strategic decisions will yield long-term outcomes for ecosystems in 10–15 years, and open, trustworthy dialogue and collaboration between ecosystem players is critical in ensuring success to the whole.
- 06 Ecosystems are mostly self-evolving driven by local economic, societal, and political factors and needs, and adapting a success formula from another ecosystem is not easy.
- 07 The clash of ideas and cultures drives ecosystems, attracting and deliberately creating conditions for the amalgamation of cultures; multi-experienced talents will enable radical innovation.
- 08 Large scale corporates and enterprises are crucial for the balancing of ecosystems, and especially in the later stages of ecosystem maturity through M&A and exits, as well as corporate venture investments with the US leading by example. Europe, especially the smaller member states, have a long way to go in catalysing CVC and exits due to its long-term investment-return cycle and high costs ¹⁵, and general innovation adoption and startup to corporate collaboration.
- 09 European collaboration between startup ecosystems is competitively fragmented, missing not only standardised and comparable ecosystem benchmarking criteria but also market-driven and rapidly scalable public sector financed R&D and innovation financing and scaling measures. The slow reaction of the education sector to provide STEAM-powered talent, brain drain to super platforms, the absence of a digital single market, diverse national legal and business regulations, local market focused (angel) investments, and competing national agendas all set barriers to Europe's growth.

¹⁵ <http://go.500.co/unlocking-corporate-venture-capital>

Startup Ecosystem models across the world through the lens of public sector involvement and governance



Graph 4: Qualitative research conducted by the order of Startup Estonia

Startup Estonia Vision & Action Plan 2021-2027

The startup sector has been one of the fastest-growing industrial areas in Estonia from 2015 to 2019. The total turnover of the startup sector in 2019 was €548 million, with €266.5 million in venture capital. Startups offered work to more than 6,000 employees and paid 68% higher salaries than the Estonian average during the same period. The flagship unicorns Bolt and Transferwise, even during the COVID-19 pandemic, are leading the ranks of Europe's fastest-growing startups with rapidly increasing valuations.¹⁶

For Estonia, startups are:

- 01** The critical component of Estonia's future innovation and success story in Europe and globally, and a vital part of Estonia's digital soft power and national strategic interest.
- 02** Creating and driving innovation in the region and opening up entrepreneurship and career opportunities outside major hubs.
- 03** Serve as role models for future innovators and founders. Becoming a startup founder or an employee is becoming a career path.

Based on the previous, we have set two ambitious goals for Startup Estonia for 2021–2027.

Enable an all-inclusive startup mindset, which offers lifelong self-realization and entrepreneurship opportunities for every single Estonian and non-native resident regardless of age, gender, nationality, location or experience.

Support the growth and impact of Estonian startup and technology sector to 15% of GDP by 2025.

¹⁶ <https://www.cnn.com/2020/05/26/uber-rival-bolt-valued-at-1point9-billion-plans-for-coronavirus-recovery.html>

Our Strategic Priorities

01. Enabling a forward-looking startup ecosystem, including regional hubs

The Estonian startup sector is a rapidly growing economic sector compared to traditional industries in Estonia by comparing investments, employment rates, and taxation to the state. In the context of the increasing digitalisation of the global economy to ICT and knowledge-based models, the development of forward-looking and globally connected startup ecosystems is a critical priority for Estonia to ensure the country's competitiveness at local, regional and international levels.

Startup ecosystem needs:

Startup Estonia is the representative of the Estonian startup ecosystem locally and globally, and a mediating platform between the members of the ecosystem and the legislator.

Startup Estonia steers the development of the Estonian ecosystem by representing the entrepreneurs and organisations in the community, monitoring and analysing, and if necessary, launching (in the framework of its mandate) essential strategies, measures, grants, and other forms of support.

The development of Estonia's startup ecosystem is a strategic priority at state level ensured by low-bureaucracy and an entrepreneurship-friendly regulatory and economic environment.

The ecosystem and business environment for startups encompasses the whole of Estonia, with the focus of development on regional hubs and initiatives (incl. the availability of opportunities, services, necessary infrastructure and financing measures in the major centres and regions).

To this end, the state supports an ecosystem that takes into account all stages of the development of startups (including sector development and (community) organizations and initiatives, sector policy and monitoring, startup creation, support, education, employment and other development measures) and keeps pace with global developments; Startups and innovation-based thinking and action will be extended to other sectors in cooperation with ecosystem-building organizations (including the public sector, education and research sectors, the creative industries and others);

Action Focus:

**Locally Global Startup Mindset
across all levels of the country**

How are we going to measure this?

- ▷ Growth of startup sector by 30% per year on average (by employees, employee taxes and investments)
- ▷ Growth of startups to scaleups or ventures with at least 10 years of operational history, especially in high tech and high added value industries.
- ▷ Growth of regional startups

Case Study:

Cleveron – Driving global robotics innovation from small town Estonia

www.cleveron.com

Cleveron, founded in 2007 and operating out of the small city of Viljandi in central Estonia, develops innovative parcel lockers and robots to streamline omnichannel initiatives and offer a seamless customer experience. Cleveron's solutions used by many industry heavyweights including ASDA, Walmart and Zara reduce last-mile delivery costs, enhance parcel delivery and return operations, and improve the omnichannel customer experience.

In 2009, Cleveron launched an academy to provide professional higher education in robotics software development in cooperation with the Estonian Entrepreneurship University of Applied Sciences.

<https://cleveron.com/news/cleveron-will-open-a-robotics-academy> Cleveron Academy's students focus on developing solutions for self-driving cars.



“

Cleveron's products are based on the notion that we are solving problems for our clients: saving costs, time and making their services more convenient. We have an attitude that if you see something which needs to be improved, then go and improve it. And not just in business, but also when it comes to community. We try to help out any way we can.

– Arno Kütt, Co-founder and CEO of Cleveron

2. Promoting an entrepreneurship and startup mindset in science and R&D, and supporting the growth of scaleups

The Estonian startup ecosystem is a catalyst for innovation, economic and social impact, driving R&D and science-derived entrepreneurship, tackling ambitious challenges and problems, and fuelling more significant investments in Estonian startups. The effect of scaleups is felt across the economy and attracts domestic and international corporates through enterprise partnerships, CVC, and exits.

Startup ecosystem needs:

(Estonian) businesses, corporations, and enterprises increasingly adopt and utilise innovations from the Estonian startup sector.

To enable high innovation initiatives in critical areas such as moonshots, circular economy and sustainability, frameworks and infrastructure shall be created either by the state or by public-private partnerships.

The state will initiate and apply policies, and actions supporting the growth of science and R&D-driven startups and scaleups, and

the protection and monetisation of their IP and assets. That includes the promotion of a startup mindset in science and education, increasing tech transfer, supporting startup and R&D-driven competence centres, and backing IP protection and the creation of patents.

In developing the collaboration between science and the R&D community and the startup ecosystem, the state focuses on enabling science and deep tech-driven entrepreneurship. Risk leveraging will be allowed, such as through entrepreneurship or customised grants. These actions will be implemented in collaboration with members of the startup ecosystem and driven by its needs and development priorities.

Particular attention shall focus on attracting CVC investors or corporates with M&A capacity to advance the exit capacity of Estonian startups and scaleups through actions and support schemes focusing on startup to corporate collaboration and investor networking, and increasing exit readiness.

Action Focus:

From Science and R&D to Startups & Scaleups

How are we going to measure this?

- ▷ Growth of science and technology intensive startups
- ▷ Increase in patents from the startup sector

- ▷ Increase in specialist employees in startups with an academic, science or other high level educational background
- ▷ Increased adoption or utilization of startup innovation in other business and economic fields via relevant product development, export and other business support actions

Case Study:

Skeleton Technologies - Fighting climate change with industrial innovation

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

Skeleton Technologies is the global leader in graphene-based ultracapacitors and energy-storage systems for automotive, transportation, grid and industrial applications. Thanks to its patented 'curved graphene', Skeleton has achieved global breakthroughs in performance and is the only manufacturer delivering solutions with such high power, high energy, reliability and long-lifecycles. The company operates Europe's largest ultracapacitor production facility and works with some of the largest companies in the world to decrease carbon emissions and fuel consumption, and to power electrification to fight climate change.

With offices in Estonia and Germany, Skeleton has raised over 60 M EUR since its foundation in 2009 from private and public investors including the European Investment Bank and EIT InnoEnergy, the innovation engine for sustainable energy across Europe. Skeleton is also a member of the European Battery Alliance, European Commission's initiative to ensure that all Europeans benefit from cleaner vehicles and more sustainable technological solutions with a competitive and sustainable cell manufacturing value chain in Europe.



“

Climate change is a threat to humanity but developing the technologies to fight against it is the biggest business opportunity for Estonia and Europe since the Internet revolution.

– **Taavi Madiberk, Co-founder and CEO of Skeleton Technologies**

3. Ensuring a diverse and competitive startup ecosystem through greater diversity in gender, age, and cultural or geographic background

A precondition for the growth and success of Estonian startups and the startup ecosystem is the presence of multi-skilled and diverse talent, (in terms of gender, age, and culture). To support this, the Estonian education system, and business and living environment needs to be more inclusive, ensuring the nurturing of talent in partnership with the needs of the sector and enabling opportunities for fresh or future founders as well as startup employees regardless of their age, gender, age or position.

Taking into account the growing competition between STEAM-powered talent, Estonia shall remain an attractive destination for highly-skilled specialists. The focus is on talent who seek long-term careers and the application of their skills and knowledge in Estonian startups, such as via the Startup Visa programme, other present or forthcoming measures and actions.

Startup ecosystem needs:

The startup sector is driven by diversity, ensuring equal opportunities for employment, career, and business regardless of gender, age, location, cultural background, or education.

The Estonian startup sector remains attractive for international, highly-skilled talent and entrepreneurs. The startup sector's needs and requirements define the measures necessary to ensure the inclusion of diverse talent, and relevant benefits for the state.

The startup, science and education sector shall launch systematic collaboration in offering STEAM-powered education programmes and related actions and initiatives to contribute to future founders and employees.

To support the startup mindset, Startup Estonia shall promote founder stories and role models from diverse backgrounds.

Action Focus:

All hands on and (future) talent powered

How are we going to measure this?

- At least 20% of the founders of startups (currently 15%), and 50% of their employees (currently 46%) are female
- At least 30% of people involved with startups are highly skilled specialists from abroad.

- ▷ Growth in the diversity of the founders and employees of startups on the basis of age, education, and location

Case Study:

Nurturing future founders and innovators:

VIVITA

<https://vivita.ee/en/>

VIVITA is an international creativity accelerator for youth and kids that develops an ecosystem of products and services (creative spaces, mentoring and technology) that help bring the ideas and visions of the children to life. VIVITA is headquartered in Tallinn, Estonia and as of September 2020 is operational in 7 countries (EE, LT, USA, JP, SG, KR, PH).

VIVITA's main aim is to establish creative ecosystems that foster and promote the development of interest in entrepreneurship, STEAM subjects, self-directed learning and creative experimenting among 8-14-year olds. VIVITA builds open makerspace facilities and invention labs for children to turn their original product ideas into working prototypes; develops a portfolio of educational technology software and hardware tools for prototyping, robotics and other creative activities; and actively

collaborates with passionate innovators and inspiring practitioners from the local startup and design communities and the academia – inviting them to mentor the children, thus giving the children exposure to real-world learning opportunities alongside these practitioners. Engaging in activities in VIVISTOPs (VIVITA's creative studios) is free of charge for all children to ensure equal access to the space to all young creative minds. The only precondition set is the expectation for the child to be motivated in creating and experimenting and to be able to work self-directedly.

In VIVITA there are no teachers nor formal curriculum. The activities are led by children themselves and grownup mentors in the space only play a supportive and inspirational role. This results in an environment with an atmosphere that creates organic interest toward STEAM related subjects, projects and professions.



“

VIVITA is striving to create a balance between self-directed activities and guided activities for children that support them in acquiring new skills and confidence needed for prototyping and bringing their ambitious ideas into life. This is done in a form that is most suitable for children, through short courses and mentoring, and additionally, what we consider the most important – by including children in ideating, designing and developing solutions for various real life projects. Children grow up fast and by giving them in the early age an opportunity to turn their wildest fantasies into reality, we will be soon witnessing a new generation of young entrepreneurs that can venture global projects with an awe-stricken nonchalance.

– **Mari-Liis Lind, Co-founder and CEO of VIVITA**

4. Implementing Open data-driven steering and foresight for the Startup Ecosystem

The foundation of the right development, leadership, and policy for the startup ecosystem is based on publicly and jointly defined terms and concepts, data and key performance indicators allowing the automated and digitised gathering of relevant information, and subsequent analysis and decision-making. Hence, the legislator (the Republic of Estonia), the public sector and ecosystem members have agreed on the definition of a startup with additional parameters allowing the identification of such a venture during its registration or incorporation.

Within the Startup Estonia strategy 2021-2027, the state shall enable the creation and implementation of a retrospective and forward-looking data infrastructure that also enables foresight. The goal of such an infrastructure shall be to measure, evaluate and provide actionable intel on the impact of the startup ecosystem on the Estonian economy in general and specific fields of the economy and society.

Startup ecosystem needs:

The creation and implementation of policies, related actions, or measures, including the assessment of their impact and the necessary

decisions required to steer the ecosystem, derived from cross-sector and systemic data, research, and feedback.

The state commissions necessary research or supports relevant procurement actions for the development and benefit of the startup ecosystem and prefers domestic scientific and research efforts. The decisions required for rapid and agile responses impacting the startup sector based on the analysis and application of real-time, open data.

State-validated data, statistics, timelines, and quality-driven databases related to the Estonian startup ecosystem are publicly accessible to members of the ecosystem and governance bodies.

The creation of a startup sector-focused data taxonomy and data collection measures. This enables the comparison of the startup ecosystem's performance in the context of the Estonian economy as a whole, as well as correlation points with other sectors, including the monitoring of startup KPIs throughout the life-cycle of the venture.

Action Focus:
Open and Data Driven Steering & Foresight

How are we going to measure this?

- Further and continuous development of the Estonian Startup Database and other relevant data collection, analysis and decision-making platforms
- Collaboration with the Statistics Board on the collection, assessment, and analysis of data on the Estonian startup ecosystem

Taking decisions on data:

The Estonian Startup Database

<https://startupestonia.ee/startup-database>

Startup Estonia launched new version of the Estonian Startup Database in January 2020. It is the most extensive source for Estonian startups. Estonian Startup Database to this date holds the data of almost 1050 Estonian startups. Estonian startups are technology-based businesses registered in Estonia, not older than 10 years (including), have a goal to develop and launch an innovative and repeatable business model with global growth potential.

Database consists of data about taxes paid, turnover, and the number of employees that

come from Estonian Tax and Customs board public data. These numbers are updated quarterly. Other startups' specific information is updated by startup founders.

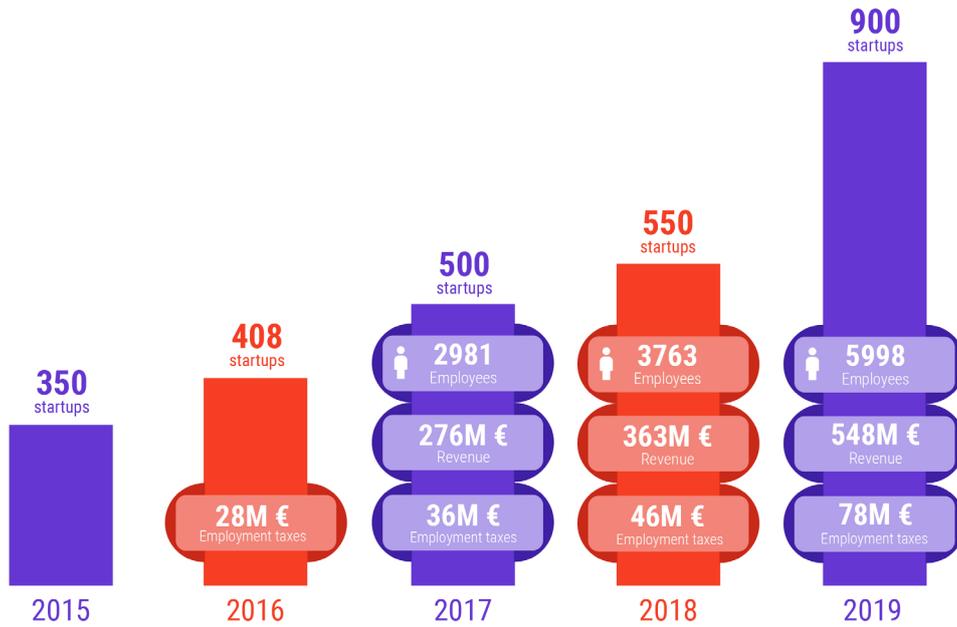
Depending on the users' needs, it is possible to get an overview of Estonian startups by ranking and filtering them by sectors, technology, stage, employee count, turnover, etc. It is also possible to create custom reports of specific sectors.

Soon the database will also give an overview of the previous success stories. Separate section about former successful startups and biggest acquisitions in the ecosystem will be added.

Additional Graphs & Statistics

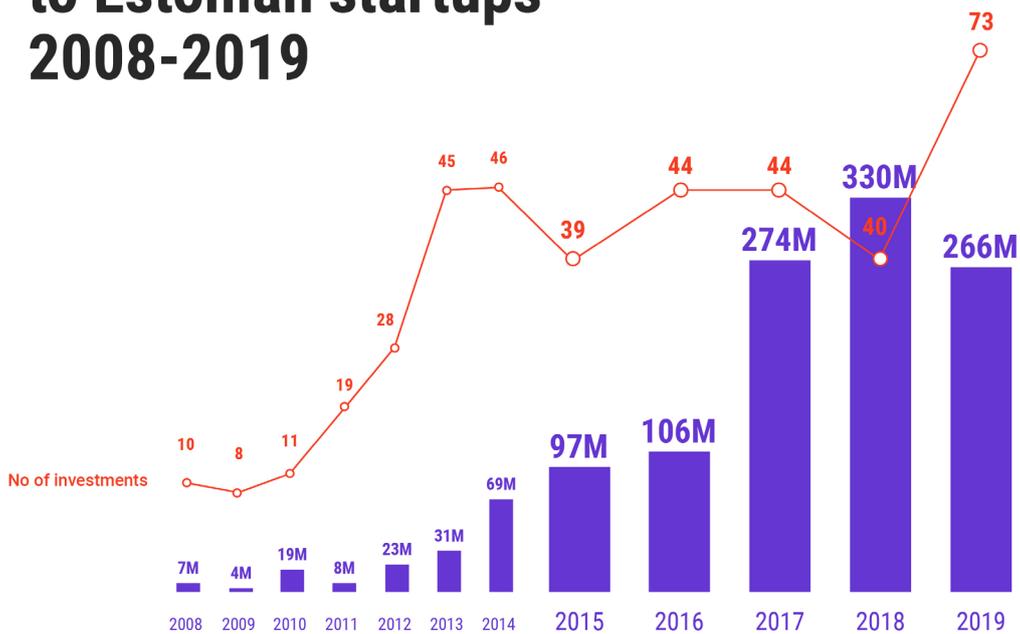
Startup sector growth 2015-2019

STARTUP ESTONIA



Graph 4: The growth of Estonian startup sector by number of startups (2015-2019). Source: Startup Estonia statistics

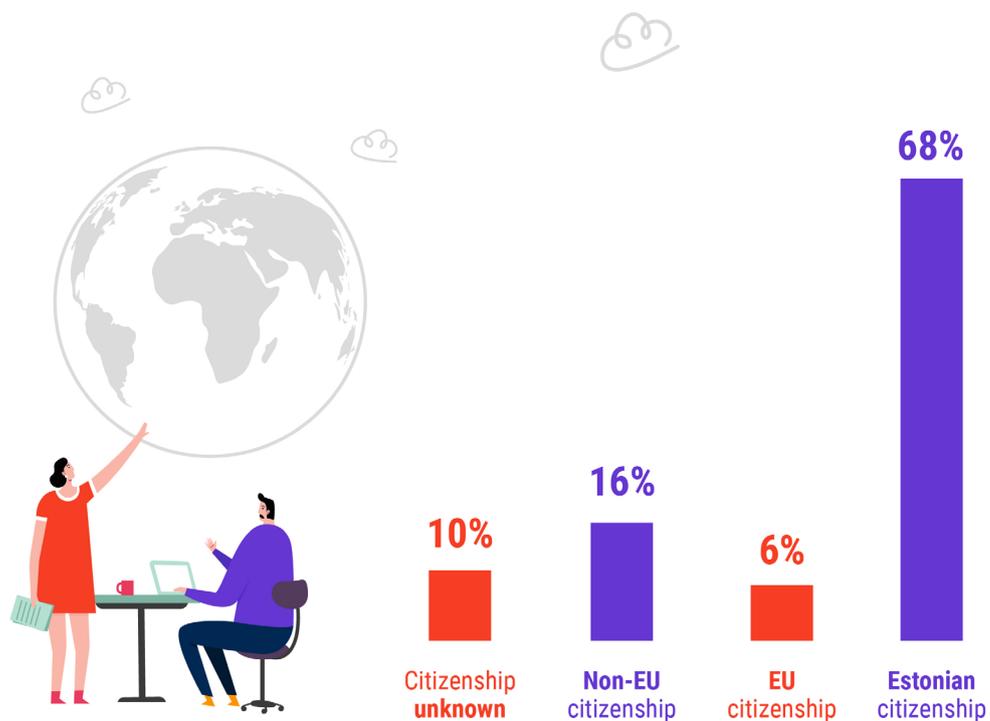
Investments (EUR) to Estonian startups 2008-2019



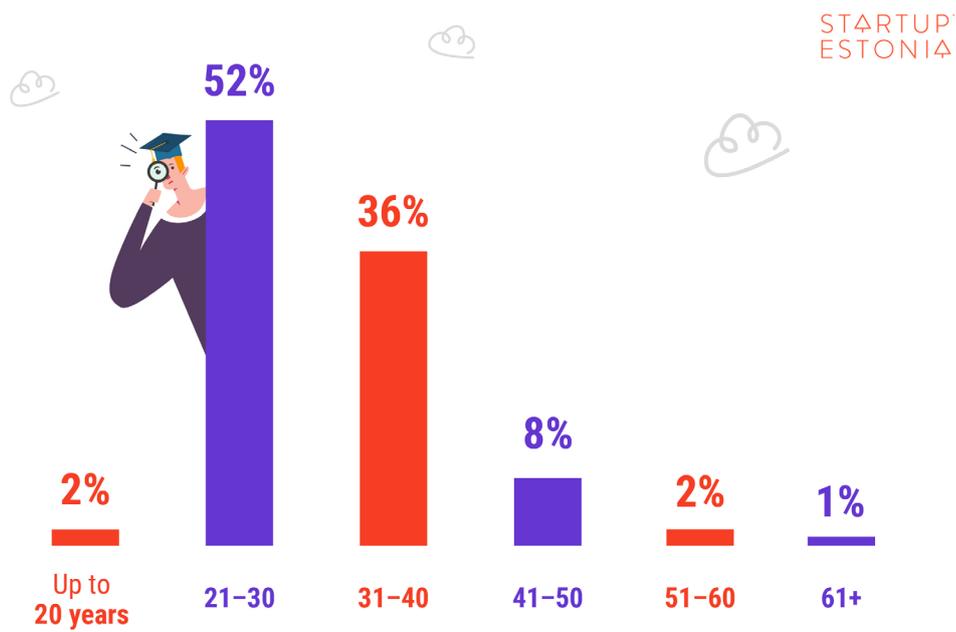
Graph 5: Investments to Estonian startups 2008-2019. Source: Funding of Estonian Tech Startups #estonianmafia



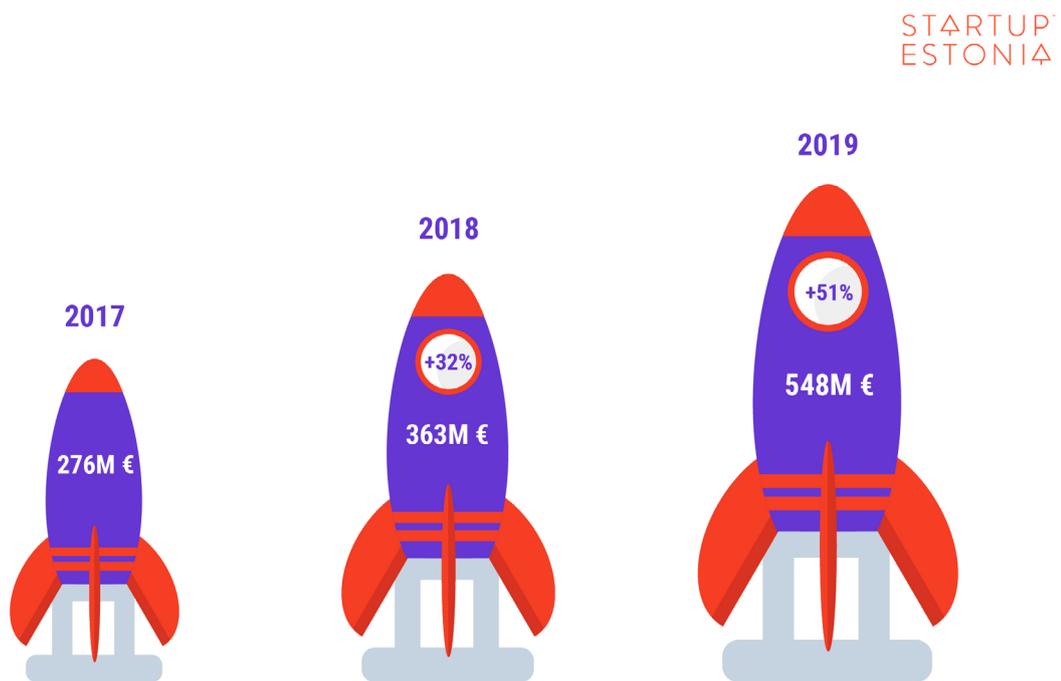
Graph 6: Number of employees in startup sector 2017-2019. Source: Startup Estonia statistics. Calculations are based on Estonian Tax and Customs Board information on paid employment taxes, revenue and employee numbers.
Note: Growth from 2017 to 2018 is 36%, from 2018 to 2019 32%. Employee numbers are given by the last day of the quarter.



Graph 7: Estonian startups employee proportions by origin (2019). Source: Startup Estonia statistics. Calculations are based on Statistics Estonia data.



Graph 8: Estonian startups employee proportions by age (2019). Source: Startup Estonia statistics. Calculations are based on Statistics Estonia data.



Graph 9: Turnover generated by Estonian startups 2017-2019. Source: Startup Estonia statistics. Calculations are based on Estonian Tax and Customs Board information.

About the Authors



Maarika Truu is Head of Startup Estonia (currently on maternity leave) helping to make Estonia one of the best places for startups by supporting the development of a vibrant and sustainable startup ecosystem. EU Startups selected Maarika as one of the fifty most influential women in European tech and venture capital (2020).

She has a background in sales and project management with 10+ years in the international startup sector working in e-commerce, B2B Saas (Pipedrive.com), HRtech startups and organising intensive weekend hackathon events (Garage48.org) boosting the local startup communities around the CEE region.

Her interests include: sustainable development and cleantech.

<https://www.linkedin.com/in/maarikatruu/>



Sten-Kristian Saluveer is an internationally acclaimed innovation strategist and consultant, audiovisual producer, content and technology entrepreneur. After more than 20 years in the audiovisual and content industry as a producer, Sten dedicates his time to advising both private and public sector organisations including the European Commission, DFFB, Accelerate Estonia, VRT Future Hubs, Estonian Ministry of Culture, Marche du Film - Festival de Cannes and others on future strategies, innovation and technology.

Sten is the Founder of Storytek /storytek.eu/ – a vertical focused mediatech accelerator and innovation hub, and heads the Innovation track, NEXT, at the Marche Du Film of the Festival de Cannes. He is also a partner at Exit Academy – a tailor-made coaching and advisory programme that helps passionate startup founders master the skills necessary for their companies to realise successful exits. In a parallel universe Sten is a known specialist on Japanese and Korean culture and cinema, a university professor, and an occasional film and music producer.

<https://www.linkedin.com/in/stensaluveer/>

The Authors thank

We would specifically and personally like to thank...

Moonika Mällo (Startup Estonia)
Viljar Lubi (Estonian Ministry of Economics and Communications)
Sten Tamkivi (Estonian Founders Society)
Mikk Vainik (Accelerate Estonia)
Marten Kaevats (Government Office of Estonia)
Ragnar Siil (Creativity Lab)
Martin Villig (Bolt)
Riina Einberg (Veriff)
Kat Borolongan (Le French Tech, France)
Marie Wall (Ministry of Enterprise, Sweden)
Guido Van Nispen (Raad voor Cultuur, Holland)
Vera Futorjanski (500 Startups, Dubai)
Anthony Saccon / Maurizio Rossi / Marta Caroti / Matteo Scanni (H-Farm, Italy)
Marc Goldberg (Maslow Capital Partners, France)
Jerome Wittamer (Expon Capital, Luxembourg)
Guy Philippe Goldstein (Makafriend, France)
Tariq Krim (Polite.one, France)
Jennifer Schenker (The Innovator, France)
Maks Giordano (Kreait, Germany)
Harald Neidhardt (futur.io - Germany)
Guillaume Klossa (Special Adviser to the Vice President, European Commission, France)
Sarah Geeroms (VRT Sandbox, Belgium)
Steffi Czerny / Alexandra Schiel (DLD Conferences)
Arie Horie (Women's Startup Lab, USA)
Amit Shafrir (Strategic Investor, Israel-USA)
Peter Bryant (Clareo, USA)
Robert Wolcott (Twin Network, Kellogg School of Management, USA)
Jussi Tapio / Miika Leinonen (Ghost, Finland)
Kristen Davis (CinqC, France)
Todd Porter / Daniel Goldman (The EdgeOf, Singapore-Japan)
Jeremy Sim (Mistletoe, Singapore)
Luukas Ilves (Guardtime, Estonia)

...and many others who contributed to this report with their ideas, knowledge, comments and critical feedback.

KREDEX

KredEx implements the Startup Estonia programme with the aim of creating more start-up success stories in Estonia

<https://www.kredex.ee/en>



European Union
European Regional
Development Fund



Investing
in your future

Startup Estonia programme (project number: EU50651) is financed by European Regional Development Fund

STARTUP[™]
ESTONIA

www.startupestonia.ee