



Tallinn: a city of the future





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Like its neighbours Lithuania and Latvia, Estonia is referred as a "Baltic Tiger" given its rapid growth since its independence from the Soviet Union in 1991. Tallinn, where more than half of the Estonian population lives, has managed to build a strong digital entrepreneurship culture throughout the years. It is home of many digital start-ups of which some turned out to be great, international success (e.g. Skype). Being a small and sparsely populated country, Estonia has faced major difficulties in attracting foreign investments and talents. It has also witnessed the departure of many of its start-ups who were not able to find locally the support and infrastructure they needed to move to the next stage of their development.

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Problem statement

In October 2015, Tallinn was ranked 20th out of 35 European cities in the European Digital Cities Index (EDCI).¹ It was placed higher than many other cities in Southern Europe and Central and Eastern Europe. Tallinn was also ranked first for its connections to the local market and fourth for a lifestyle that promotes entrepreneurship.²

Tallinn and entrepreneurship

Over the years, Tallinn has developed a strong digital entrepreneurship culture. Skype was developed by a team of Estonians for example, and since then the country has attracted investors' attention and inspired other entrepreneurs, especially in the field of technology.

Ericsson has also located its 4G technology innovation and production operations, and is home to NATO's Cyber Defence Centre of Excellence.

However, because Estonia is a country with a small population, nearly half of which live in Tallinn, the digital development of the country and its capital tend to coincide.

Nevertheless, many factors have contributed towards making Estonia and consequently Tallinn a clear model for a digital city.

According to many observers, the roots of Tallinn's entrepreneurship culture can be found in its history, particularly following its independence from the Soviet Union.

In 1991, Estonia started to face the challenges of a modern society without the Eastern Bloc's support, so it had no choice but to do this the most modern way, using ICT tools, as well as modern technologies.

Enterprise and Innovation Strategy

Estonia's technological transformation has moved very quickly. This is demonstrated by the fact that in December 2013, Tallinn City Council adopted the Enterprise and Innovation Strategy, which aims to create better opportunities for the development of enterprises and innovation in Tallinn, and consequently to increase Tallinn's competitiveness.³

In doing so, the strategy determines the developmental trends for enterprises and innovation, consolidates the activities of the various fields of activity into an integrated base document, and creates the preconditions for the long-term planning of the city's policies and activities.

The strategy has been built around a clear vision: by 2018, Tallinn aims to become an internationally open city that fosters entrepreneurship and creativity, while promoting cooperation among enterprise stakeholders and the development of knowledge and skills.

The three objectives of the Strategy

In achieving this goal, three general objectives have been mapped out for the strategy, which are expected to be pursued by both the public and private sectors by 2018:

- The employment rate for 20 to 64 year olds in Tallinn will be 82% (in 2012 it was 78.1%), which will mark a return to pre-crisis levels, and this implies an increase in citizens' engagement;
- Labour productivity per worker in Tallinn companies based on net added value is expected to be at least €30,800 (in 2011 it was €20,300). This means that both company revenues and cost effectiveness (excl. labour costs) must increase at the given average rate, thereby also ensuring a uniform sustainable capability to keep the relative (percentage of) growth in wages at a similar level to the Estonian average;
- Companies are expected to invest at least €1.38 billion in fixed assets (€0.91 billion in 2011)

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Realised benefits and new opportunities

Future opportunities for the city

According to the strategy adopted by Tallinn City Council, new opportunities for the city should follow two directions.

The first relates to service industries, which provide approximately 4/5 of the added value in Tallinn's GDP, and its prioritisation requires further development of the city's strengths.

The second direction concerns the development of future technologies, which include hardware and software solutions and have great potential to improve quality of life and make everyday activities more effective.

ICT, the fuel of Estonia's growth

Information and communications technology has proved to be Estonia's most promising sector in the last decade. This sector already has a strong entrepreneurial base, as well as the know-how and readiness of universities to develop in cooperation with businesses. It is considered vital for other activities as it is a cross-cutting sector that could trigger the development of other fields.

Creative industries:

Another sector that requires new ideas and innovations is the creative industries. It also supports other entrepreneurial sectors and plays a crucial role in the creation of internationally competitive products.

Health technology and services

Demand for healthcare services is increasing worldwide with the aging of the population. In Estonia in particular, the first steps for the development of healthcare services include information technology solutions.

In this area, Estonia has taken part in the following international projects: Virtu (virtual elderly care services for the Baltic Sea islands); Dreaming (monitoring of the medical status and safety of the elderly in their homes); and Innocare (improving quality of life for elderly people living at home and increasing their safety with the help of technology).

Financial services

In the context of regional diversity, the European Union's developmental trend for financial services is focused on more uniform market regulations and a more open market.

This would provide smaller Estonian companies with opportunities to enter the European market. In this regard, Tallinn is Estonia's financial centre and can be further developed thanks to its strong IT base, with initiatives such as FinanceEstonia.

Transport and logistics

Because of its geographical position, Estonia is an attractive transit country. This feature has positive impacts on the development of other sectors, such as construction, food industry and rolling stock. Currently, Estonia - and Tallinn in particular - is focusing on the distribution of petroleum products, a sector that creates greater than average added value.

Mechatronics

Mechatronics is a multi-disciplinary technical field that includes mechanical engineering, electronics, and information technology systems, and which has great potential for creating solutions that improve operating efficiency.

Opportunities exist in Tallinn for the development of sector-based knowledge and skills and for the testing of new solutions. For example, a fully-automated robotic manufacturing system, which can independently produce various high-tech components according to programmed software without any human intervention, has been installed at the Mechatronicum Innovation Centre, located on Tallinn's Tehnopol campus.

Environmental technologies

Technologies in this sector are currently playing a crucial role, as Tallinn aims to achieve the title of European Green Capital in 2018. Besides positive environmental impacts, the use of environmental technology solutions also provides monetary savings (e.g. passive houses), and Estonia, as well as Tallinn, could participate in international networks for their development and play a leading role in the coordination of these activities



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Drivers and obstacles

Tallinn already had a strong privatised ICT sector in the 1990s, which has been identified as one of the main factors that has triggered and further developed the ICT businesses and infrastructures that are in place today. The deep financial support from the EU after becoming a Member State in 2004 has enabled Tallinn to strengthen its digitalisation process.

However, the city has faced many challenges in developing its digital strategy: as a small country with a small population and small market, many local start-ups have had no other choice but to move abroad after reaching their growth stage.

A

Drivers

Many factors have contributed to making Estonia and consequently Tallinn a clear model for a digital city.

Firstly, the ICT sector in Estonia was already strong and developed in the 1990s. In this regard, the fact that the country's telecoms infrastructure was privatised by the mid-1990s has been considered a factor that has triggered and further developed the ICT businesses and infrastructures that are in place today.

Secondly, Estonia's small scale (just 1.3 million people), together with its business-friendly policymaking and low levels of red tape, has resulted in a high level of efficiency and low level of bureaucracy.

Financial support

Since Estonia joined the EU in May 2004, Tallinn and other Estonian cities have received investment and funding from the EU. Together with an increase in national investments and business angels (i.e. Estonian Business Angels Network), they have contributed to the creation of many digital projects and various kinds of technology-related infrastructures across Estonia, including its capital Tallinn.

Although most of the opportunities and initiatives providing funding take place at national level (i.e. Enterprise Estonia and Eesti.ee), the main initiative at local level is Prototon, a fund (set up by Tallinn Science Park Tehnopol, Swedbank and Tallinn University).⁴ Its aim is to finance the development of prototype products.

Start-ups or private companies can apply to this programme, putting forward ideas in the field of electronics, mechatronics, information and communication technology. This programme has been mentioned as one of the most significant initiatives in the process for stimulating digital entrepreneurship by the European Commission.

Key stakeholders

Garage 48 HUB

Garage 48 HUB is a community-led co-working space in central Tallinn for start-ups, creative, tech and entrepreneurial people from Tallinn, Estonia and beyond. Garage48 HUB is the "start-up house" for Estonia's tech and start-up community. Its main goal is to facilitate interaction among the community and offer a place to meet up, work, learn and relax, in addition to organising hackathons.⁵



Tallinn business incubator

The City of Tallinn's Tallinn Business Incubator (set up in 2006) is aimed at start-up entrepreneurs with ambitious business ideas and export potential. It offers advisory, training, networking and information services and opportunities to rent office space under favourable conditions.

In addition, it provides help for strengthening sales in foreign markets, helping support the globalisation of creative individuals and companies throughout Estonia. The Tallinn Enterprise Incubator is made up of three enterprise incubators in Tallinn: the Creative Incubator, Ülemiste Business Incubator (specifically serving technology-based companies) and Kopli Business Incubator.⁶



Start-Up Wise Guys

Start-Up Wise Guys is one of the leading accelerators in Europe. From its hub in Tallinn, they connect innovative and ambitious start-ups from around the world to experts from Europe and the US. Founded in 2012, it has run five programmes and over 40 companies have been accelerated.⁷



Key initiatives

In Tallinn, many initiatives have had significant impacts on the development of its digital strategy. The main ones, driven at national level, concern e-Government services on the one hand and public transport on the other.

e-Residency, a world leading digital service

e-Residency is a digital service provided by the Estonian government. It is a transnational digital identity available to anyone in the world interested in administering a location-independent business online, enabling secure and convenient digital services and facilitate credibility and trust online.⁸



Source: e-Estonia

X-Road

An interesting initiative is related to e-government and open data. Estonia has developed a specific mechanism, named X-Road, which links public and private databases into the country's digital services. This is what enables Estonia's various databases and registers, whether public or private, to link up and operate irrespective of what individual platform they use.

Public transport

In terms of public transport, Tallinn has shown itself to be a digital and smart city too. This has been important for its cross-border cooperation, especially with Finland.

Thanks also to the initial EU financial support linked to participation in the "MIMOSA" project, as part of the CIVITAS Plus initiative, Tallinn rolled out a new smartcard ticketing solution in 2009 requiring passengers to register their trip using a personal contactless card when entering vehicles.⁹

Guide for start-up entrepreneurs

To promote and foster local entrepreneurship and encourage an entrepreneurship culture to develop in Tallinn, its City Enterprise Department compiled and published a "Guide for start-up entrepreneurs."¹⁰

The guide aimed at providing interested people with all the information required on business development and access to fundraising, both public and private.

Helped by grants from the city of Tallinn, three start-ups have managed to successfully develop their business: Säästvad Ehituslahendused OÜ, Professional Wear Group OÜ, Tolm OÜ (company providing animation and visual communications services).

Berkeley University 4-week programme

A good example of Tallinn's recognition as a digital-friendly entrepreneurship context is the Berkeley University 4-week program "Berkeley Startup Bootcamp", which took place in Tallinn in 2015. It provided an intensive, fast-paced learning environment, in collaboration with innovation experts from Microsoft and Samsung, a top UC Berkeley instructor, business mentors and serial entrepreneurs.¹¹

"Cities have a lot to gain from cross-border cooperation and the case of Tallinn is a clear example" – Tarmo Kalvet, Tallinn University of Technology

Helsinki-Tallinn: Collaborating Across Borders

The capitals of Estonia and Finland have historically had a close relationship. Estonia's entry into the EU in 2004 and the development of a fast two-hour ferry service have both facilitated flows of people and merchandise between the cities.

Differences, in terms of infrastructures and labour market issues, and similarities, such as ICT strengths, start-up environment and technologically sophisticated public services, between the two cities have created the basis for cross-border collaboration between Helsinki and Tallinn.

This cooperation is developing the area as not only a well-connected and strategic transport hub, but also an entrepreneur-driven hotspot for innovation. A series of ongoing cross-border initiatives are taking place.

For example, Start-Smart (cooperative cross-border project aimed at supporting entrepreneurial attitudes in both countries and accelerating the emergence of innovative enterprises) and the Cross-Border Small Business Environment (project creating a network between southern Finnish and Estonian business incubators with a view to developing the business activities and competitiveness of Finnish and Estonian companies).



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Key infrastructures

The creation of many start-up incubators and accelerators, as well as the presence of two technological parks within the city, has facilitated and sparked the city's digital development.

This is reflected in the figures for start-ups in the city: Tallinn is home to more than 500 start-ups, with around 200 set up every year. 70% of them are considered successful, as they export to foreign markets, while 10% are considered extremely successfully, gaining high visibility on the global market.

Tallinn Science Park Tehnopol

Tallinn Science Park Tehnopol is a science and business campus that aims to advance technology-based entrepreneurship in Estonia, bring scientists and entrepreneurs together and provide suitable conditions and a suitable environment for developing breakthrough business ideas. Today, there are nearly 200 companies (from start-ups to Skype) operating on the Tehnopol campus.¹²

Ülemiste City

Tallinn's digital mission is also demonstrated by the creation of a smart, digital city within Tallinn: Ülemiste City.

Launched in 2005, Ülemiste City aimed to create the largest centre in the Baltic States for creativity, innovation and business, characterised by its international reach, making the city attractive as a knowledge-based environment for work, development and living.

Today the city's 36 hectares host 81,000 sq.m of office space for 200 companies and 6,000 employees. By 2025, the city is expected to include 200,000 sq.m of office spaces and 125,000 sq.m of apartments, as well as cultural centres, cafes and parks.

In relation to ICT, Ülemiste City offers digital solutions through personal development and training courses, workshops and seminars on digital issues and support for local start-ups.¹³

B

Obstacles

Lack of a sufficient national market for start-ups

In becoming a digital city model, Tallinn has faced many obstacles. Since Estonia is a small country with a small population, this means that its market and talent pool are also small, forcing many start-ups created in Estonia to move abroad once they have reached their growth stage.

Attracting FDI remains challenging

Tallinn has encountered difficulties related to its capacity to attract foreign investment, as well as its ability to attract talents and highly skilled workers.

In this regard, the Archimedes foundation has been very active. The foundation coordinates national initiatives aimed at improving the competitiveness of Estonian higher education. This includes the compatriots programme, a scholarship schemes for improving mobility and marketing Estonian higher education and research abroad.

Difficult access to capital and skills

Tallinn suffers from a low rate of access to capital and competent skills (Tallinn ranks 20th out of 35 European cities) as well as knowledge spillover (where Tallinn is ranked 25th). This negatively affects the development of start-ups and local enterprises.

For instance, most of the activities relating to innovation are funded through European Territorial Cooperation programmes; private funding for these activities remains low.

Many start-ups created in Tallinn have experienced problems related to its ambitions, which are often too local-focused, instead of being international. In addition, weak intellectual property rights and a lack of venture capital funding are other difficulties that many local businesses have reported.

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Lessons learnt

Many lessons can be drawn from the case of Tallinn. The economic crisis has had many negative repercussions on the city's digitalisation process, which means that learning to spend less resources in a smarter way has been crucial.

Cooperation, not only between local entrepreneurs, but also on the international stage, can benefit a country's entire economy, as well as specific university programmes aiming to create or enhance entrepreneurial skills.

International ambitions and cooperation

In a global economy that is becoming increasingly integrated, limited international competencies and entrepreneurs' weak contact networks in foreign markets should be avoided.

Conversely, higher international ambitions, information exchange and cooperation with other stakeholders in other countries (e.g. Berkeley Startup Summer Bootcamp and Helsinki-Tallinn collaboration) are considered to be key success factors, particularly in the private sector.

Benefits of entrepreneurial programmes

Implementing programmes aimed at creating or enhancing entrepreneurial skills can be beneficial for the country's overall economy.

In the last few years, Tallinn has faced concerns about entrepreneurs' limited developmental capabilities, i.e. their knowledge and skills, which are often insufficient for implementing innovations.

This, together with little information exchange and cooperation between entrepreneurs and enterprise support structures, has hindered some achievements with the digital transformation.

Repercussions of the economic crisis on digitalisation

As in the case of many other countries, Estonia's economy has deeply changed in the last few years as a result of the economic crisis.

Spending resources in a smarter way is important for ensuring a growing and successful economy, but on the other hand it requires greater efforts to ensure continuing development, achieve a better position in the international value chain and increase wellbeing.

Trust and privacy laws

There have also been privacy issues linked to having personal data online. While this is true on the one hand, on the other hand Estonians have deeply embraced the concept of keeping data online, as the country's systems have seen few serious security breaches that could test people's faith.

Many residents say that online services are more secure and convenient than traditional methods of dealing with the government. For example, around 98% of people file their income taxes online through an automated system that takes roughly five minutes to complete. This has had many positive repercussions since it has increased overall tax compliance, halved the agency's staff and allowed the government to issue tax refunds within a week.

"We have to protect everyone's privacy. Trust is a basic principle. If people can't trust e-services, they will never use them" –
Andrus Ansip, former Estonian Prime Minister & European Commission's vice president for the Digital Single Market

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Key Recommendations

The case of Tallinn has demonstrated that the support of big companies is crucial to local businesses and start-ups, especially in the international arena.

In this regard, the public sector should also be engaged in promoting local companies abroad, giving visibility to local businesses, creating the conditions for future business opportunities.

Cross-border cooperation can also lead to business opportunities, as illustrated by the close collaboration between Tallinn and Helsinki.

Public sector should provide visibility for national businesses on the international stage

The third recommendation drawn from Tallinn's experience concerns the role of public administrations. In becoming digital, the public sector should support local businesses and especially small and young start-ups as much as possible.

In addition, giving them more visibility on the international stage and providing them with growing funding opportunities could foster the activities of local businesses, as well as benefiting the country's entire economy.

"The public sector should do more to support start-ups, becoming ambassadors on the international stage" –
Martin Goroško, Head of Startup Incubator

Support from big companies is crucial to small ones

Tallinn's digital experience embraces several key recommendations, which go beyond the city's borders. As mentioned above, Tallinn has many start-ups looking to conquer international markets.

In doing so, these businesses face costly and risky activities. Attempting to export to foreign markets with support from big companies or multinationals, of which Estonia has many, could enable start-ups, particularly small ones, to achieve more successful outcomes.

Cross-border cooperation benefits national economies

Cross-border cooperation can bring positive results, and this is true for both the private and public sectors. Tallinn is cooperating closely with the city of Helsinki and through this cooperation it has been able to achieve many successes in the field of energy, transport and smart cities integrated solutions for example.

This is demonstrated by the fact that travelling between the two regions is increasingly easy with constantly decreasing transport costs. Studies have shown that the Uusimaa (Helsinki) and Harju (Tallinn) regions already form an ly integrated economic area, with strong synergies in various sectors.

Thinking about the scalability of solutions implemented elsewhere and how they could be replicated is something that cities and start-ups should consider, and this has been true in the case of Tallinn, particularly with its digital transformation path.



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Key Recommendations

Category	Role of the stakeholder
Local government 	<ul style="list-style-type: none"> Invest further in projects aiming to attract international investment Open up access to public infrastructure for technology and develop projects Invest more in key infrastructures for a business-friendly environment, such as transport infrastructures, business offices, university buildings Give more visibility on the international stage for Estonian start-ups
Universities/ Research centres 	<ul style="list-style-type: none"> Attract more students, researchers and talents in the digital field from the rest of Europe and beyond Create the conditions to stimulate an entrepreneurial mind-set in the university Assess digital skills requirements Align curricula with industry requirements Strengthen the digital competence of the university
Businesses 	<ul style="list-style-type: none"> Collaborate with other stakeholders from the digital ecosystem Traditional companies should seek support for the application of digital opportunities Experiment in a cooperative environment (e.g. Tehnopol, Garage 48) Tech companies should support traditional companies with their digitalisation efforts
Incubators/ Accelerators 	<ul style="list-style-type: none"> Connect businesses with relevant stakeholders to enable their digital transformation Ensure the existence of good digital infrastructures Act as an advocate to voice the concerns of local firms Interact and support young entrepreneurs in their entrepreneurial ventures

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