

SWEDISH ENTREPRENEURSHIP FORUM

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Swedish Sportstech

Top Three in Europe

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Sportstech, a complex market with many different sectors

Sportstech is not just an industry with a single audience. It is a complex mix of technologies, business and investment models, and audiences who are all linked to technological solutions that are utilised in sports. These solutions are used for many purposes, such as supporting elite athletes to help them perform at the highest level, checking the attendance at football practice, and providing fans with the latest news about their idols. Or it could be how the San Jose Sharks analyses crowd movement patterns in their stadium to make sure food orders are taken to the correct seat during a hockey game.

In order to clarify what is being discussed in this report, we will start with the definitions of sports, technology and sportstech.

The EU defines sports as “all forms of physical activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental wellbeing, forming social relationships or obtaining results in competition at all levels”¹ (Katsarova and Halleux, 2019). In “Taxonomy of Sportstech”, Frevel *et al.* (2020) first discuss the definition of technology where they use the definition put forward by Rogers (2003), which emphasises hardware and software.² They then go on to further develop the definition of technology in relation to sportstech in more detail and describe three main areas (Figure 1). The first category primarily includes physical technology (hardware) and includes advanced materials, sensors, the Internet of Things, and biotechnology. The technical solutions are often used to collect data. The

1. The EU sports policy, [https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI\(2019\)640168](https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2019)640168)

2. “A technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome. A technology usually has two components: (1) a hardware aspect, consisting of a tool that embodies the technology as a material or physical aspect, and (2) a software aspect, consisting of the information base of the tool.” (Rogers, 2003).

second category is focused on data management and the processing of data, artificial intelligence, and machine learning.

The third category includes human interaction through information, communication, and augmented reality. Frevel *et al.* (2020) describes sportstech as the intersection between sports and technology.

FIGURE 1. THE THREE MAIN AREAS OF TECHNOLOGY IN SPORTSTECH WITH ILLUSTRATIVE EXAMPLES

<p>Advanced materials, sensors, devices, Internet of Things, and biotech</p>	<ul style="list-style-type: none"> • Advanced new materials • Composites • Coatings/adhesives/sealants/elastomers • Fibers/textiles • Wearables 	<ul style="list-style-type: none"> • Advanced manufacturing • Digital manufacturing • 3D-printing • Robotics • Automation • Internet of Things 	<ul style="list-style-type: none"> • Sensors • Smart dust • Chips • Near-field communication • Drones • Biotech
<p>Data, artificial intelligence, and machine learning</p>	<ul style="list-style-type: none"> • Big data • Synthetic data • The Cloud • (Advanced) analysis • Artificial intelligence • Machine learning 	<ul style="list-style-type: none"> • Blockchain • Decentralized internet • Quantum computing • Cognitive computing • Computer vision 	
<p>Information, communication and extended reality</p>	<ul style="list-style-type: none"> • Augmented reality • Virtual reality • Mixed reality • Mobile • 5G 	<ul style="list-style-type: none"> • Applications • Voice • Sound • Bots 	

Source: Frevel *et al.*, 2020.

FIGURE 2. FRAMEWORK STRUCTURE AND DEFINITIONS

<p style="text-align: center;">For Athletes Activity & Performance</p> <p style="text-align: center;">For Activity – Hardware</p> <p style="text-align: center;">Wearables Equipment and Infrastructure</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">For Activity - Software</p> <p style="text-align: center;">Tracking and Analytics Classes and Tutorials</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Before / After Activity</p> <p style="text-align: center;">Booking and Discovery Recovery and Injury Prevention Coaching and Recruitment</p>	<p style="text-align: center;">For Fans Fans & Content</p> <p style="text-align: center;">Content Platforms News and Content Streaming Platforms</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Fan Experiences Fan Engagement Ticketing and Merchandise</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Fantasy Sports and Betting Fantasy Sports Betting Enablement</p>	<p style="text-align: center;">For Executives Management & Organisation</p> <p style="text-align: center;">Organisations and Venues Team and Club Management League and Event Management Stadium and Facility Management</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Media and Sponsors Media Production Sponsorship</p>
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Note: For more detailed definitions, see *European SportsTech Report 2021*.³

3. SportsTechX, *European SportsTech Report 2021*, <https://sportstechx.com/estr/>

In order to analyse this complex market, we will be using the SportsTechX⁴ framework and definitions as described in the European SportsTech Report 2021 (ESTR21) (Penkert and Malhotra, 2021). Among other elements, SportsTechX presents data regarding the number of start-ups, how these are distributed across Sweden, and the value of the invested capital in the Swedish and European markets in euros.

The three main sportstech user groups are defined in Figure 2. These are athletes, fans, executives in clubs, associations, competition organisers, and venue owners. Each user category contains groupings of various technological solutions with a description of when these solutions are primarily used.

The technological solutions aimed at athletes can largely be sorted into the following categories: hardware used during athletic performances, software used during activities, and different solutions that are used before and after athletic performances. These can include different tools for coaches, such as AI based solutions that signals if adepts run the risk of suffering an injury, or platforms used to book sessions or signing up for a race.

When reviewing products aimed at fans, we find platforms for services such as news and streaming services. These can include products and services that exist to increase fan engagement at, inside, or outside the venue, but in equal part ahead of and after games and events. A third area in this group includes Esports,⁵ where Sweden is ahead of the curve with platforms that enable participation on international markets.

The third group of main users is executives within organisations. Here we find technological solutions that make it easier to communicate within associations, but also comprehensive solutions for venues and apps used for ticket sales. This is also where we find media productions, such as EverySport Media Group, a Swedish media group in sports and gaming. This group also includes sponsorship solutions.

What does the research say about sportstech?

When it comes to research about sportstech, no analysis of the Swedish ecosystem or the value of the market has been produced. There also has been no studies regarding how innovations in sportstech affect clubs and organisations from a financial perspective, or how digitalisation has impacted the development of new sportstech goods and services in Sweden.

4. SportsTechX is an organisation that collects data and insights regarding sportstech startups and the surrounding ecosystem <https://sportstechx.com/>

5. A collective term for competitions that are conducted using computers or gaming consoles where the contestants play against each other in different kinds of computer and video games, <https://www.svenskesport.se/esport>

In 2015, there were however three reports published about the Swedish sports industry: "Idrottens värden och effekter" (The Values and Effects of Sports), "Sportbranschen i siffror" (The Sports Industry in Numbers), and Innovationsagenda för framtidens sport (The Innovation Agenda for the Future of Sports). In The Values and Effects of Sports, the authors and "Stockholms Idrottsförbund" (the Stockholm Sports Confederation) presented measurable facts regarding a) what the sporting community does, b) its social benefits and c) in what fields a positive impact has been observed (Sternö and Nielsén, 2015a). In the report "Sportbranschen i siffror – statistik och definition för Sverige" (The Sports Industry in Numbers – Statistics and Definition for Sweden), the authors illustrate the complexity of the sports industry and highlight the lack of a shared SNI-code for the whole sports sector, and how this makes it difficult to give an account of the total turnover, the number of businesses, and the number of employment opportunities offered by the industry. (Sternö and Nielsén, 2015b). At the same time, they show that the sports industry has grown stronger on a global level and that it now accounts for a significant proportion of the global economy. In the European Parliament's policy document on sports, it is stated that more than seven million people have a sports-related job, which represents 3.5 percent of total employment in the EU. Sports-related goods and services amount to 294 billion EUR, which is almost three percent of the EU's total gross value (Katsarova *et al.*, 2019).

The third report highlights a sector in which Sweden has "a unique opportunity to create innovation and growth on a global market" (GIH and Swedish ICT, 2015). The authors' vision for the Swedish sports sector is that:

Sweden shall become a pioneer in creating technology-based product, service, and system innovations within the sports sector with three priority areas for impact: performance, events and public health. Sweden shall also have a digitised sports industry at the forefront of technological development that delivers measurable values both for society, the business sector, the sports community, and science.

The agenda points to areas that are of the highest interest for developing the Swedish sports sector even today.

All in all, the three reports provide a comprehensive picture of how complex the sports industry is, and how important its contributions to public health, Sweden's GDP, and technological innovation are.

Multiple organisations and businesses publish reports and white papers annually concerning the development of the global sportstech market. These organisations and

businesses include: SportsTechX⁶, Colosseum Sport⁷, Global Sports Innovation Centre by Microsoft (GSIC)⁸, N3xt Sports⁹, Sport Innovation Lab¹⁰, Sports Tech World Series (STWS)¹¹, Comcast NBCUniversal SportsTech¹² and Sports Tech Research Network (STRN)¹³. These reports focus on the different sections within sportstech, such as fans and wearables and the digitisation of different sports, as well as what investments have been made and the invested amounts and sectors. Most reports reflect the developments in sportstech on a global market, but in certain cases, they focus specifically on Europe, Asia, and North America. In combination with these reports, there are also podcasts and masterclasses being launched continuously that go more in-depth on startups, trends, and market developments.

These reports rarely contain detailed analyses of individual countries. There are also currently no joint reports for the Nordic countries regarding what investments are being made, what investments have been made, or what the investment climate is like on the Nordic market. However, in 2020–2021, a survey of the associations, research, and development environments, as well as the currently active investors in the Trondheim region was conducted, which resulted in the report “Aktørkartlegging innen aktiv sport og fritid i Trøndelag” (Survey of Actors within Active Sports and Leisure in Trøndelag) (Skjelstad and Benum, 2021). In 2019, LaunchVic teamed up with KPMG to conduct a survey of the startup ecosystem surrounding sportstech in Victoria, Australia. (Bertram and Mabbott, 2019). This report looked at both the strengths and weaknesses of the Victoria region. It also analysed the key factors to success in other countries and regions. The conclusions of the report will be further analysed towards the end of this publication, where they will also be compared to the current situation in Sweden, as well as the lessons that can be learned to help develop the Swedish ecosystem. As of today, no similar analyses and surveys of sportstech have been conducted in Sweden.

Innovation and entrepreneurship in sports

In 1934, Joseph Schumpeter’s Theory of Economic Development was published. Schumpeter described entrepreneurs as agents of creative change, whose innovative activities were a crucial element of economic development (Porter and Vamplew, 2018). In the 1980s, Stephen Hardy began studying entrepreneurship in and around sports. Hardy was the first to focus on the entrepreneur as a key figure in the development of sports. Hardy saw the need for more in-depth research in three areas: sports products,

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6. SportsTechX, <https://sportstechx.com/reports/>
 7. Colosseum Sport, <https://www.colosseumsport.com/reports>
 8. Global Sports Innovation Centre by Microsoft (GSIC), <https://sport-gsic.com/reports/>
 9. N3XT SPORTS, <https://www.n3xtsports.com/reports/>
 10. Sports Innovation Lab, <https://www.sportsilab.com/reports>
 11. Sports Tech World Series (STWS), <https://sportstechworldseries.com/annual/>
 12. Comcast NBCUniversal SportsTech, <https://www.comcastsportstech.com/inside-track/> and https://f.hubspotusercontent40.net/hubfs/6852642/SportsTech_LandscapeReport_v1.11.pdf.
 13. Sports Tech Research Network (STRN), <https://strn.co/>

the role of the entrepreneur, and the role of the investor in the development of sports organisations. This research primarily focused on the North American markets and the emerging sports industry. There have been two researchers in particular who have used Hardy's arguments to advance the research in this field. These are George Sage and Dilwyn Porter. Sage assumes that there are three economic segments: performance, marketing, and production. Porter has also conducted research and added an additional dimension to the three mentioned by Hardy, and that is the combination of sports products and media, which also serves as a method for linking consumers to the product.

Porter also proposes that sports entrepreneurship can be studied by observing how different combinations of activities within and outside sports can be linked to new products and services (Porter *et al.*, 2018).

In recent years, Wray Vamplew has rewritten Hardy's definition of a sports entrepreneur and describes it as: "those persons who act as change agents in the supply of sports products, who attempt to increase the output of the industry, improve the consumer experience, or raise interest in sports products by such means as developing new markets and creating new products".¹⁴ The text discusses how sports has developed as a product and as an industry through the efforts of entrepreneurs and investors. Between 600 billion USD and 1.3 trillion USD was spent globally on sports related products (Jones *et al.*, 2020).

Vanessa Ratten has formalised and identified parallels between sports and entrepreneurship (Hayduk, 2020). She presents multiple attributes that are necessary in both sports and entrepreneurship, such as proactivity, resilience, and being willing to take risks. Other important characteristics are creativity and innovation. Regarding sports as a phenomenon, it is an activity that exists in all cultures. In this way, sports have a very special place in society, and no two competitions are alike (Jones *et al.*, 2020). The sport product itself is highly uncertain as the quality of, and the built-up excitement during, a game or competition cannot be guaranteed from the outset. Nevertheless, the value chain of sports is immediate as production, distribution, and consumption all happen at the same time. Through these characteristics, there has been speculation that sports are the ideal test lab for learning about entrepreneurship as a phenomenon. Ratten has defined this philosophy as "sports-based entrepreneurship". She also believes that those who are good at sports would also make for good entrepreneurs, and vice versa. Furthermore, she describes sports-based entrepreneurship as interdisciplinary and defines the framework as "some form of business operation or entrepreneurship in a sports context" (Jones *et al.*, 2020). Jones *et al.* (2020) describe different types of entrepreneurships within the sports-based entrepreneurship.

14. The original Swedish version of the document contained a free translation of the quote in question.

- Opportunity entrepreneurs start businesses because they see and seize opportunities. These entrepreneurs are often located in well-developed countries with available resources. They have a developed personal networks, available capital, and technical know-how. At the same time, they have access to a significant system to support entrepreneurs through programmes, incubators, and Science Parks.
- Necessity entrepreneurs often develop their businesses because they have no other choice.¹⁵ These entrepreneurs are often located in developing countries without fair access to capital, ownership rights, employee rights, or training opportunities. Under these circumstances, people are facing greater difficulties in finding secure employment.

Hayduk *et al.* emphasise that when looking at these two models for entrepreneurship, it may be perceived as if sports-based entrepreneurship is different depending on the country in question. They highlight the fact that sports-based entrepreneurship should rather be viewed as a series of components in a process where sports is the central driving force. Another type of sports-based entrepreneurship can be found in large companies that catalyse their inner innovation processes by utilising sports. The authors list Google, Amazon, and Twitter as examples of this, as all three live stream sports digitally to drive interest in their so-called over-the-top (OTT) media services. OTT serves as a method for providing tv and film content on demand over the internet to suit the wishes of the individual consumer. As such, the term over-the-top itself refers to a provider providing content in addition to the existing internet services.

These digital services provide an opportunity to be seen and operate globally. Social media and OTT services have also not only helped well-known athletes and major teams gain more exposure, they have also enabled lesser known athletes to take the spotlight and develop their brands.

In his article, Hayduk (2020) discusses how sports-oriented technological entrepreneurship helps develop entrepreneurship as a whole and how the technical framework contributes towards a scalable economic development in a new dimension. This is made clear by studying how new technology helps innovative startups to develop and change the sports product market. Hayduk also addresses how the business strategies used by sports organisations has changed through investments in entrepreneurship. Example of how teams and leagues who have created innovation hubs or who are collaborating with partners include Barcelona Innovation Hub¹⁶ and Euroleague Basketball Fan XP.¹⁷

Ratten and Jones (2020) present five main points that they view as the foundation of sports-based entrepreneurship.

15. This entrepreneurship is also called opportunity-driven and necessity-driven entrepreneurship. More details are available in the 2021 GEM Report.

16. Barcelona Innovation Hub, <https://barcainnovationhub.com/acerca-de/>

17. Euroleague Basketball FanXP, <https://fanxp.euroleague.net/>

1. The sports industry functions as an ecosystem, with network members spreading and contributing information. This information is crucial for making the right decision at the right time. The ecosystem contributes to both cooperation and competition.
2. Entrepreneurs are individuals with different views on progression and business development.
3. Entrepreneurship is a dynamic process with no exact recipe for success. The underlying motives can be both non-profit and profit-making solutions.
4. Sports-based entrepreneurship is best viewed from different perspectives, where both the physical and digital aspects are highlighted, in addition to the division of sports into social community, amateurs, and professionals.
5. Public authorities have a strong influence over sports-based entrepreneurship, both directly and indirectly through decision-making processes and regulations.

All ecosystems consist of different definitions by different stakeholders. Freeman (1994) defines stakeholders as entities whose support is required for an organisation to exist. In order for an organisation to develop further, some consideration needs to be given to how the stakeholders' involvement can add and develop value. Stakeholders can include the media, the public, public authorities, and other social parties (Ratten *et al.* 2020). Some stakeholders in the sports ecosystem are more important than others, depending on their position in various networks. The more connections a stakeholder has both within their own network and to other parties, the more influence they can exercise at different stages. Jones *et al.* explains the different stages that startups go through: standup, startup, and scaleup, as well as the activities and events that are often associated with these stages.

- a) Standup; at this stage, ideas are tested through different means, such as hackathons, innovation challenges, speed dating for generating ideas, entrepreneurship meetups and networking meetups. These events help spread information about new ideas and challenges. They fill an important function in disseminating the information, as well as improving visibility.
- b) Startup; different contributing components are often accelerators, co-working studios, networking meetings and angel investors. During this stage, the original idea transforms into an actual business concept. This requires a deeper understanding of the market, and also experimentation with different business models.
- c) Scaleup; key components during this phase are angel investors, crowdfunding, private equity, and mentoring programmes. Shifting gears is important during this phase, as is bringing the product to market. This often requires different kinds of resources, including time and money.

It is important to remember that every step of the sports entrepreneurial ecosystem is affected by the digital development of the global economy. The global market has gone

from being manufacturing-centric to focusing on knowledge and services. This also has an effect on the relationship between the producer and the consumer in that it becomes one of joint value creation (Vargo *et al.*, 2008). It also affects how services in sports are consumed and marketed. The entire sports industry is changing, going from solely being a production industry to also be based on digital tools (Ratten *et al.*, 2020).

Examples of these digital solutions include competitions that used to only be performed physically now also being held digitally using digital sportstech products such as virtual races in different disciplines.¹⁸ Other areas where digitalisation has played a major role, and that is also a subject of study for Potts and Thomas (2018), is how the new sports economy is being developed around storytelling. This sector, with products and services aimed at fans, has attracted 44 percent of the global investments made between 2015–2020 (Global SportsTech VC Report, 2020).

Esports, which is a fully digital product and a part of sportstech, has developed extremely rapidly over the last couple of years. The various stakeholders in Esports are the viewers, sponsors, advertisers, content, hardware and software producers, and also distributors. This industry has seen very rapid growth and has achieved significant media reach, which, among other things, has led to the amount of prize money being competed for exceeding those of some traditional sports. This has led to a sharp increase in interest among venture capitalists. Between 2012–2017, 350 investments were funded by 5 billion USD (Hayduk, 2020). Consumers of Esports differ from regular consumers in that they are younger, more globally diverse, richer, and from different backgrounds. Sweden has a strong position in the development of sportstech for esports contestants, with the two largest investments in Swedish sportstech in 2020 being the Esports platforms G-Loot¹⁹ and Challengermode.²⁰ Traditional sports have also embraced Esports. Examples of this include the Swedish Professional Football Leagues, who now host eAllsvenskan every year.²¹

Tjønndal (2020) describes one important characteristic of innovation in sports, and that is its ability to create value both privately and publicly. Traditional studies of innovation and entrepreneurship within the business sector primarily focus on the creation of value within the private sector and innovation within the public sector to create greater value to the general public. Sports innovation often includes value creation for both sectors.

Investments in sportstech in Sweden and Europe

What are the investment trends in sportstech and where is Sweden in relation to the rest of the Nordic countries and to Europe?

18. One example of such a race was Digitala Midnattsloppet (The Digital Midnight Run), <https://midnattsloppet.com/digitala-midnattsloppet/>

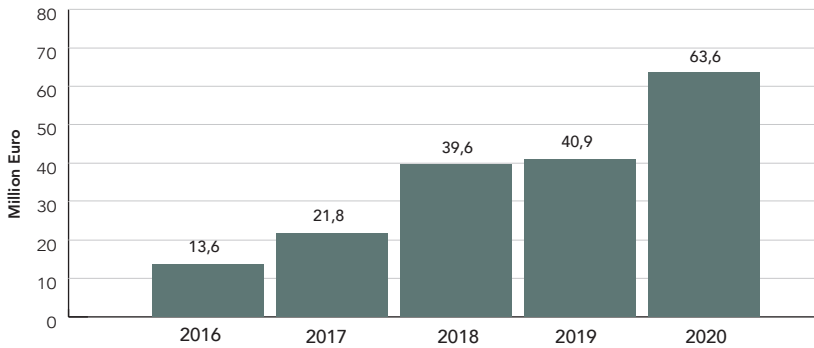
19. G-Loot, <https://gloot.com/>

20. Challengermode, <https://www.challengermode.com/lol?lang=sv>

21. eAllsvenskan, <https://www.svenskelfotboll.se/league/eallsvenskan/>

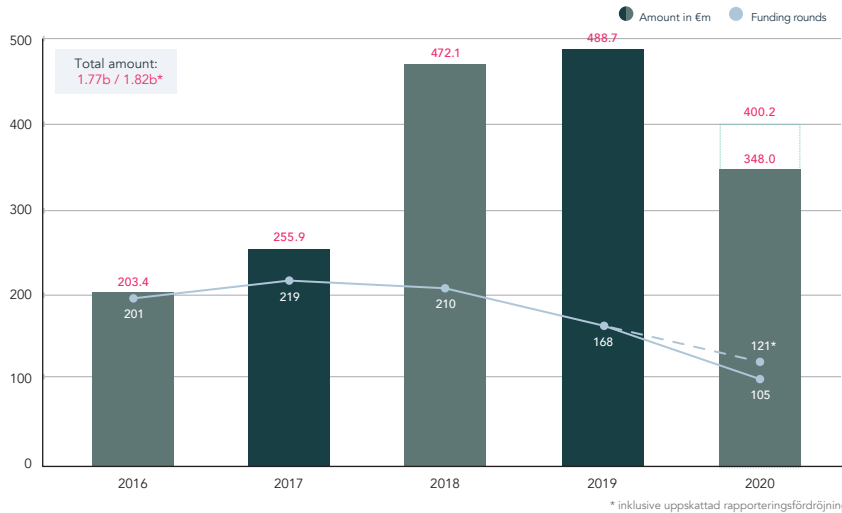
The total sum of invested euros in sportstech in Sweden has increased more than four-fold from 2016 to 2020. If we compare this to the number of transactions, we can see that the investments have maintained a relatively stable level between 2016–2019 and that during 2020, they fell to five from the previous approximately 14 per year (Figure 3). This is consistent with the trend seen all across Europe, with increased volumes of invested euros, but a declining number of transactions. Sweden does however stand out compared to the rest of Europe in 2020. The trend remained positive in Sweden, while Europe saw a year of less capital being invested.

FIGURE 3. DEVELOPMENT OF FUNDING 2016–2020 IN SPORTSTECH IN SWEDEN



Source: Data from SportsTechX.

FIGURE 4. FUNDING AMOUNTS AND NUMBER OF ROUNDS 2016-2020 IN EUROPEAN SPORTSTECH



Source: European Sportstech report 2021 (ESTR21)

When the investments are analysed in detail with regards to the distribution between European countries (Figure 5), we can see that Sweden is in fourth place on the list of

investments with a total amount of 184,2 million EUR over the five-year period between 2016–2020. If we zoom in on 2020, Sweden climbs to third place with two of the largest investments in Europe, G-Loot and Challengermode, both platforms for Esports players. In total, 63.6 million EUR were invested in Swedish sportstech in 2020.

FIGURE 5. FUNDING IN EUROPEAN SPORTSTECH BETWEEN 2016-2020.

Countries by Funding 2016-2020				Countries by Funding in 2020		
#	Country	Amount (€m)	Ranking by number of startups	#	Country	Amount (€m)
1.	United Kingdom	476,2	1	1.	United Kingdom	97,3
2.	Germany	290,9	3	2.	Germany	88,9
3.	France	195,5	2	3.	Sweden	63,6
4.	Sweden	184,2	6	4.	Finland	25,5
5.	Romania	175,0	32	5.	France	17,4
6.	Israel	104,5	7	6.	Ireland	16,9
7.	Finland	59,9	12	7.	Israel	14,7
8.	Ireland	56,0	11	8.	Norway	12,3
9.	The Netherlands	33,5	5	9.	Spain	4,2
10.	Norway	25,2	14	10.	Turkey	1,8

FIGURE 6. FUNDING IN SWEDISH SPORTSTECH 2016–2020

Cities by Funding 2016-20 in Swedish Sportstech			Funding in Stockholm 2016-20		
City	Amount (€m)	Number of startups	Year	Amount (€m)	Number of startups
Stockholm	156,9	43	2016	11,3	10
Malmö	5,9	4	2017	18,1	13
Helsingborg	5,0	3	2018	26,8	6
Hovås	4,7	2	2019	37,1	9
Gothenburg	2,9	4	2020	63,6	5
Other cities	4,2	6	Totalt	156,9	43
Total	179,6	62			

FIGURE 7. STOCKHOLM’S POSITION ON THE LIST OF CITIES BY FUNDING IN EUROPEAN SPORTSTECH BETWEEN 2016-2020 AND IN 2020 RESPECTIVELY

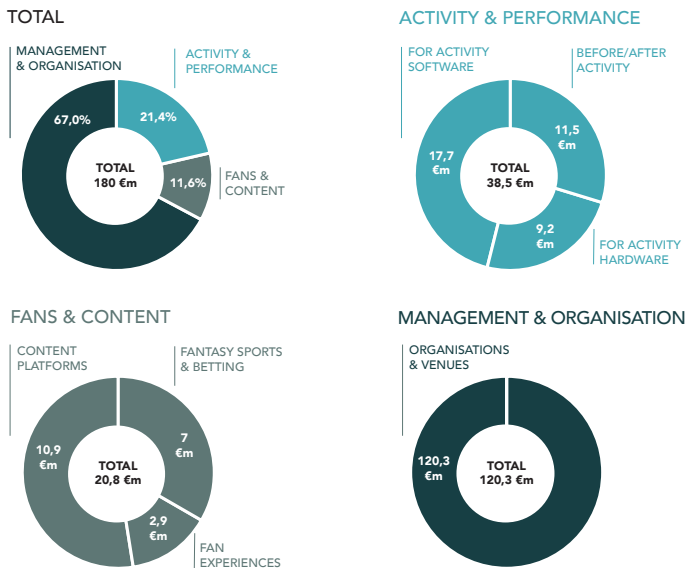
Cities by Funding 2016-2020 in European Sportstech				Cities by Funding in 2020 in European Sportstech		
#	City	Amount (€m)	Ranking by number of startups	#	City	Amount (€m)
1.	London	413,9	1	1.	London	73,4
2.	Bucharest	175,0	57	2.	Stockholm	63,6
3.	Stockholm	156,9	5	3.	Berlin	55,6
4.	Paris	135,6	2	4.	Oulu	25,5
5.	München	134,7	13	5.	München	24,2
6.	Berlin	116,5	6	6.	Dublin	16,9
7.	Oulu	52,9	87	7.	Petah Tikva	14,6
8.	Dublin	51,2	10	8.	Nottingham	13,6
9.	Petah Tikva	43,0	67	9.	Oslo	12,3
10.	Givatayim	34,4	430	10.	Paris	11,0

Source: Figures 5 and 7: European SportsTech Report 2021 (ESTR21). Figure 6, Data from SportsTechX

In order to get a sense of how investments in sportstech are distributed throughout the country, the number of transactions and invested capital will be analysed in this upcoming section. Stockholm clearly stands out with a total of 43 investments at a total value of 156.9 million EUR between 2016–2020. Malmö, which is in second place, only has four transactions amounting to a value of 5.9 million EUR. When all investments are taken into account, Stockholm is in third place in all of Europe. With 2020 as the comparison year, Stockholm is in second place behind London, followed by Berlin, and well ahead of other European cities (Figure 7).

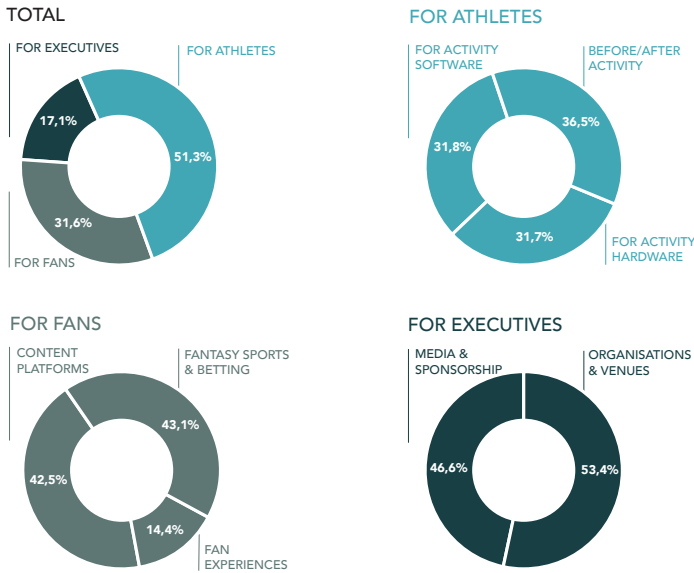
When studying how investments are distributed in detail, we are using the framework with the three comprehensive sectors that was introduced at the start of the report: athletes, fans, and executives (in clubs, associations, competition organisers, and venue owners). In Sweden, the largest investments have been made in the executive sector at 66.9 percent, or 120 million EUR in total. At the same time, the highest number of investments can be found among startups aimed at athletes, around 50 percent out of a total of 62 investments (Figure 8). If we compare this to Europe, the highest amount of invested capital was made in sportstech with solutions aimed at athletes, 51.3 percent, followed by goods and services aimed at fans, 3.16 percent, and in third place, we find solutions aimed at executives, 17.1 percent (Figure 9). It is interesting to note that investments made in Sweden deviate from the pattern seen in the rest of Europe, with the largest number of investments being directed at the executive sector.

FIGURE 8. FUNDING PER SECTOR AND SUB SECTOR 2016 – 2020 IN SWEDISH SPORTSTECH



Source: Data from SportsTechX.

FIGURE 9. FUNDING PER SECTOR AND SUB-SECTOR 2016 - 2020 IN EUROPEAN SPORTSTECH



Source: European Sportstech report 2021 (ESTR21).

How many startups and in which sector?

We now have a clear image of Sweden’s standing compared to other European countries when it comes to investment volumes and the number of investments made in 2020, and in the last five years. The next question is: How many sportstech companies are there in Sweden and how are they distributed across the country? Out of the 87 companies registered in the SportsTechX database, 51.7 percent are located in Stockholm, followed by Malmö at 10.3 percent and Gothenburg at 6.9 percent (Figure 10).

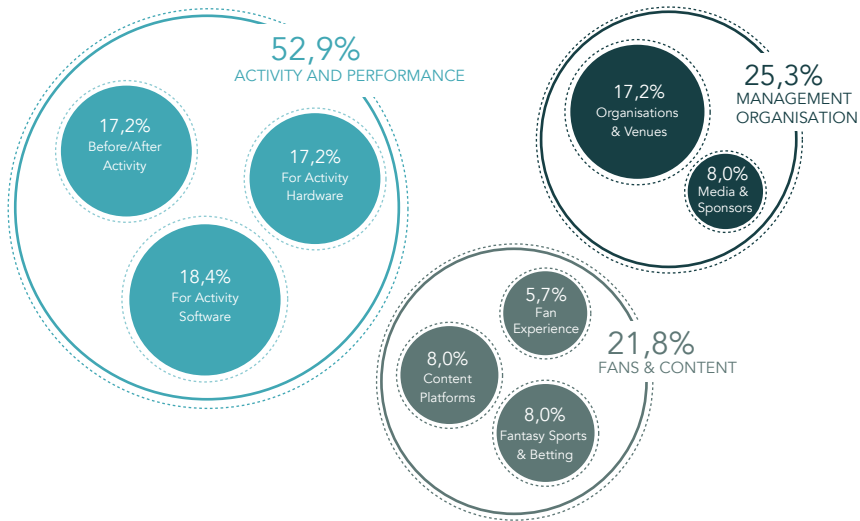
FIGURE 10. THE DISTRIBUTION OF SPORTSTECH STARTUPS ACROSS SWEDEN, THE FIVE CITIES WITH THE MOST STARTUPS

Startup Distribution in Sweden		
City	Quantity	Percentage
Stockholm	45	51,7%
Malmö	9	10,3%
Gothenburg	6	6,9%
Lund	3	3,4%
Linköping	3	3,4%
Other cities	21	24,1%
Total	87	100,0%

Source: Data from SportsTechX.

Upon a closer examination of the number of startups divided across the three main groups, we can see that the largest number of startups, around 53 percent, can be found in the athlete sector, followed by the sector with solutions aimed at executives and organisations, 25 percent. The fan sector contains the lowest number of startups, 22 percent. If we compare these figures to the situation in Europe in 2019, we see a similar distribution, with 50 percent of the companies being aimed at athletes. However, the number of companies aimed at fans is higher, 28 percent, compared to the number of startups aimed at executives and organisations, at 22 percent (Figures 11 and 12).

FIGURE 11. AMOUNT OF STARTUPS PER SPORTSTECH SECTOR IN SWEDEN IN 2020



Source: Data from SportsTechX

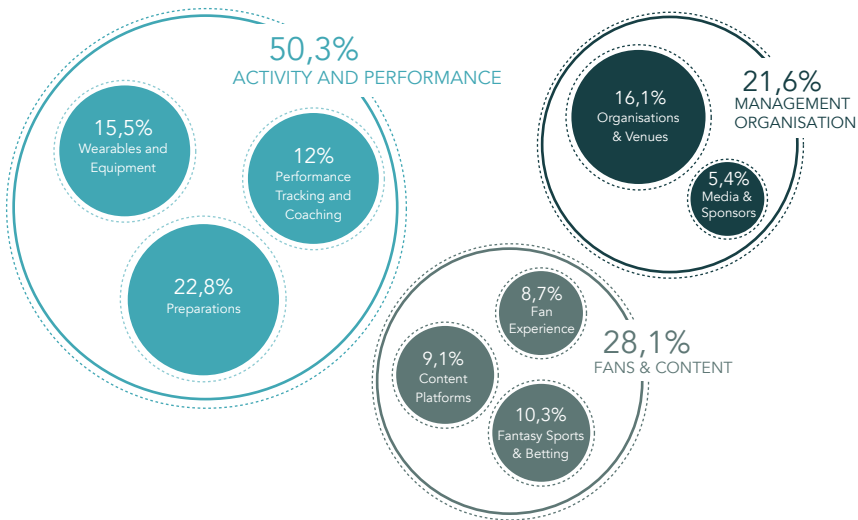
Having highlighted how the number of startups are distributed geographically across Sweden, and also across the different sectors, we now have a clearer picture of sportstech in Sweden, both in terms of investments, and Sweden’s position in the European competition.

Between January and November 2020, 38 investments and acquisitions were reported at an approximate value of 1.4 billion EUR within the gaming industry.²² In comparison, five investments were made in sportstech in 2020, amounting to approximately 63.6 million EUR. In 2019, the gaming industry, iron ore, and wood pulp each had a turnover of around 25 billion SEK.²³

22. The Swedish Games Industry’s Game Developer Index 2020, <https://dataspelsbranschen.se/nyheter/2020/10/29/var-8e-mnniska-p-jorden-har-spelat-ett-svenskt-spel>

23. In order to compare the sportstech industry to other Swedish industries, as well as its development, an annual report similar to the game developer index would be highly desirable.

FIGURE 12. AMOUNT OF STARTUPS PER SPORTSTECH SECTOR IN EUROPE 2019



Source: European Sportstech report 2020 (ESTR20)

The keys to success

In 2019, LaunchVic teamed up with KPMG to conduct a survey of the sportstech startup ecosystem in Victoria, Australia. (Bertram *et al.*, 2019). One of the goals was to identify opportunities and important factors for success in countries at the forefront of new sportstech startups. Two of the regions highlighted in the report as of particular interest were California in the United States and London in the United Kingdom. Some of the underlying key factors were:

- a) A world-leading ecosystem for startups, close collaborations with academia, and experienced founders.
- b) Access to capital and investors dedicated to sportstech.
- c) The sports sector having a genuine interest in, and commitment to, innovation and technology.
- d) A world-leading tech ecosystem.
- e) Being the home of several major clubs with a strong interest in innovation, including club-based accelerator programmes.
- f) The local state/region/city government and public authorities rallying behind a focused investment.
- g) Sportstech being viewed as a gateway to increased physical activity and public health.

Below is a short summary of Sweden’s position in relation to the key factors identified above.

- a) Sweden has a well-developed startups ecosystem, but currently lacks a focus on sportstech. Many universities have occasional initiatives but lack long-term engagement and funding. A few sportstech accelerators have been conducted in Sweden, but there is no dedicated, standing investment.
- b) There are no venture capital firms who report that they are solely investing in sportstech.
- c) There is currently a lack of knowledge and understanding in the Swedish sports sector regarding what sportstech is and the solutions it currently offers.
- d) There is a well-developed ecosystem surrounding tech as a whole. Sweden has universities and institutes of technology in more than 20 cities, and virtually all of them have a regional ecosystem with incubators, accelerators, and innovation support. Additionally, the Global Innovation Index has ranked Sweden among the three most innovative countries in the world every year for more than a decade.²⁴
- e) Sweden is completely devoid of major clubs with an interest in innovation similar to that of the Barcelona Innovation Hub. The investments made by national federations and organisations are also small and insufficient compared to other countries.
- f) Some smaller investments have been made in different parts of the country, where organisations such as the Swedish Agency for Economic and Regional Growth have made an effort to develop a specific region, but there is no support on the national level.
- g) Sportstech has yet to receive this level of recognition in Sweden. The Swedish Research Council for Sport Science, which allocates state funds to finance research within the field of sports, has no dedicated sportstech section. There are also no national awards similar to the ANZTA in Australia and New Zealand.²⁵

How can we boost sportstech entrepreneurs in Sweden and further develop our position in Europe?

During the writing of this report, discussions have been held with representatives from our neighbouring Nordic countries,²⁶ as well as from Belgium,²⁷ to gain an understanding of their work in activating the sportstech ecosystems. All respondents point towards

24. Global Innovation Index 2021, https://www.wipo.int/global_innovation_index/en/2021/

25. ANZ Sports Technology Awards, ANZTA, <https://anzsta.com.au/>

26. Håvard K. Bjor (Igloo Innovation and Norwegian Sport Tech), Carsten Couchouron (SportsLab Copenhagen)

27. Kristof De Mey (Ghent University and SportsTech Research Network)

three core pillars that must be in place in order to empower and develop the ecosystem. These are: trust, value creation, and a vision for the future. One example of a necessary element, one that has also been emphasised by Business Sweden²⁸, is the need for an industry organisation which serves as the organiser for training sessions, projects, and internationalisation trips.

London has been hailed as a role model in its capacity as a city with a very strong sports-tech ecosystem. The decision-makers there have a clear goal: being the most active city in the world.²⁹ As a step in this direction, the Sport Tech Hub has been launched.³⁰

It is an incubator operation for startups that use sportstech to make the residents more active, and also to improve public health. The benefits of sportstech have been clearly emphasised in London, as has sports innovation and its ability to be a value-creating factor both for the private and public sector with regards to giving people a reason to be active, and for preventative public health measures.

Many of the companies in Sweden that are currently targeting professional clubs, teams, and association are often small and niche, while the issues are large and complicated. In addition, Swedish clubs are generally more immature and resource-poor as buyers. As such, there is often a gap where a club needs to stitch together many parts and suppliers to create a comprehensive whole. This leads to the results rarely living up to the club's or startup's expectations.

One possible solution would be closer collaborations between the startups and the clients, as well as clubs and leagues coming together to find solutions to problems. It is also important to create natural points of contact between entrepreneurs and stakeholders from the sports sector (and also media, venues, the fitness industry etc.) so that discussions can be held concerning problem definitions. This could potentially create a competitive advantage for the Swedish sportstech ecosystem. If we could bring more companies together and deliver technological package solutions, it will be easier for us to enter the major international arenas.

The Australian Sports Technologies Network³¹ (ASTN) was founded in 2012 by industry-leading companies, public authorities, leagues, teams, federations, suppliers, and non-profits to help Australian sportstech companies scale and commercialise their technology into international markets, while also helping universities and research institutions to

28. During meetings with Business Sweden in the spring of 2019 and 2020, calls were made for an industry organisation that could serve as a co-applicant when applying for project grants from Nordic Innovation, among others.

29. London Sport, <https://londonsport.org/>

30. SportTech Hub, <https://www.sporttechhub.co.uk/>

31. Australian Sports Technologies Network, <https://astn.com.au/>

commercialise projects. Norway has the organisation Norwegian Sport Tech³², which has a close collaboration with Igloo Innovation³³, an information and innovation centre in Oslo. These organisations are the linchpins of the sportstech ecosystem in Norway and serves as counterparts to Innovation Norway for implementing, for example, internationalisation projects. A critical aspect for sportstech startups in Sweden is the ability to quickly enter the international market in order to scale up their operations. And in order to do that, there needs to be a clear structure in place through which the companies can receive assistance to help them grow internationally. If public resources could be made available to these companies so that they could gain access to well-developed international networks, this would be very beneficial. In order for public resources to be allocated, it is likely that, at the very least, a structured analysis and national strategy for health and sportstech would be required, possibly as a supplement to the Government plan dubbed Sweden’s national life sciences strategy.³⁴

The structures currently in place in Sweden, such as Business Sweden, are not members of and do not have representatives in any special interest networks, such as Sports Tech World Series³⁵, The Sports Tech Research Network³⁶, or Women in Sports Tech.³⁷

The bottom line is that the following items must be put in place in order for Sweden to create a well-developed ecosystem that creates confidence and value with a clear vision for the future:

- An organisation with the stakeholders that are active in the ecosystem must be established in order to create a natural exchange of problem definitions.
- Given that the sportstech industry has a problem with its supply of capital, investors need to improve their knowledge of the industry and gain a better understanding of the companies within the sector. This could be done through an industry organisation, as outlined above.
- The sportstech industry needs to be better at demonstrating its value to society at large, and to be seen as a natural gateway to physical activity and public health.
- The sportstech market should be included in a national strategy. Sportstech companies need public support in order to scale up and reach international markets.

32. Norwegian Sport Tech, <https://www.norwegiansporttech.com/>

33. Igloo Innovation, <https://iglooinnovation.no/om/>

34. Sweden’s national life sciences strategy, Government Offices of Sweden 2019, <https://www.regeringen.se/4aac74/contentassets/cdda3e9fc7be4ea5b55afc99c5221fab/en-nationell-strategi-for-life-science.pdf>

35. Sports Tech World Series, STWS, <https://sportstechworldseries.com/>

36. The Sports Tech Research Network, <https://strn.co/>

37. Women in Sports Tech, WiST, <https://www.womeninsportstech.org/>

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Benjamin Penkert is a sportstech expert who served as a management consultant and strategy expert at multiple major companies before joining the world of startups through various positions. In 2018, he started SportsTechX together with Rohn Malhotra. Since then, he has released annual reports regarding international developments within the sportstech industry. He has also constructed a global database around the sportstech ecosystem containing investors, startups, initiatives, incubators, and accelerator programmes.

This policy summary is part of a series produced by Swedish Entrepreneurship Forum on businesses which can be described as "Swedish miracles".

We have published a number of reports on industries where Swedish companies have excelled through strong growth, as well as international recognition. The series has highlighted the video game, music, and fashion industries.

The series is now moving on to examining businesses which may qualify as future miracle industries. We will be analysing the sportstech, edtech, cleantech, and foodtech industries. Doctoral researchers compile a summary of the current state of the research and developments in the industries. The authors then present economic policy proposals aimed at further facilitating entrepreneurship.

