Challenges and Best Practices for Supporting the Growth of the

Deep Tech Sector

in the BSR-5 Region

REPORT

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The FINEST SCALEUP Consortium:

TALLINNA TEHNIKAÜLIKOOL

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(Startin.LV)

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Introduction

This report is part of the project funded under the Horizon Europe Programme, FINEST SCALEUP, Grant No. 101114356, which brings together leading research and innovation actors to establish a cross-border, inclusive, and gender-equal deep tech innovation ecosystem in the Baltic Sea Region countries—Estonia, Latvia, Lithuania, Finland, and Poland, collectively referred to as BSR-5.

The first part of this report is drawn from a database of deep tech startups and scaleups in the BSR-5 region, created for the project, and presents statistics on these companies and the entire ecosystem. The second part is based on 17 interviews conducted between July and September 2024, featuring representatives from deep tech startups and scaleups, universities, business support institutions, and investment funds, offering their unique perspectives on the challenges and best practices for supporting and developing deep tech solutions, along with the knowledge and experiences of the project's partners and publicly available reports.

Please note that this study has its limitations. For the database of startups and scaleups, we decided to work with the Dealroom platform. The platform offers several advantages – existing tools for organizing lists of companies and statistics about them, information about investment history, industry, and technology tags for ease of discovery, among others. On the other hand, Dealroom acquires much of its information by scraping data from the internet, which can make some data unreliable, and younger startups and spinoffs with less digital footprint underrepresented. For the second part, which focuses on challenges and best practices, we aimed to ensure that each party—whether a startup, scaleup, fund, university, or business support institution—was represented. However, due to limited time, we were not able to speak with all key stakeholders across all five ecosystems.

We hope that the insights shared in this report will contribute to the expansion of knowledge regarding deep tech support methods among local players, while also helping foreign funds and startups, interested in expanding their activities in the region, to better understand this ecosystem.

We encourage you to explore our project platform and follow updates about the project on our LinkedIn.

The FINEST SCALEUP project is as initiative implemented by:

FinEst Centre for Smart Cities, TalTech (EE)	EIT Digital (BE)
Latvian Startup Association "Startin.LV" (LV)	Digital Knowledge Observatory Foundation (PL)
Krakow Technology Park (PL)	Startup.LT (under the Innovation Agency Lithuania) (LT)
Lithuanian Innovation Centre (LT)	Estonian Business Angels Network (EE)

Part I – Deep Tech ecosystem in BSR-5, Eduards Ritums, Startin.LV

Statistics based on Finest Scaleup project startup and scaleup company database

Out of 509 startups and scaleups currently in the Finest Scaleup database, 183 (36%) are based in Finland, 88 (17%) in Estonia, 52 (10%) in Latvia, 48 (9%) in Lithuania, 125 (25%) in Poland, and 13 (3%) were founded at one of the BSR-5 countries, but currently have an HQ registered elsewhere (Table 1). There are more startups and scaleups to discover in these ecosystems due to less visibility for newer startups, and some startups and scaleups not being properly tagged in other databases and needing to be found indirectly.

Table 1. Startups by HQ location, Dealroom data:

Number	Country
183	Finland
88	Estonia
52	Latvia
48	Lithuania
125	Poland

134 (26%) of the companies in the database were founded in the past 5 years. Most companies were founded in 2018 – 62 (12%) – with a declining trend in both younger and older companies (Table 2.). While older companies are subject to survivorship bias and younger companies might have less visibility and are not yet included in the database, these two factors would not fully account for this trend.

Table 2. Startups by year founded, Dealroom data:

Number	Year
4	2024
13	2023
28	2022
42	2021
47	2020
53	2019
62	2018
55	2017
56	2016
50	2015
27	2014
30	2013
22	2012

According to Dealroom tags for the companies, 429 (84%) are B2B, 26 (5%) are B2C, 32 (6%) are both B2B and B2C, while 24 (5%) are not tagged (Table 3.). This is very expected for a database of deeptech companies, as science intensive innovation is rarely aimed directly toward consumers.

Table 3. Startups by client focus, Dealroom data:

Number	Type
429	B2B
26	B2C
32	B2B and B2C
24	Not tagged

A surprising number of companies in the database were innovating (Table 4.) in the Health industry – 201 (39%). The next two biggest industry tags were Energy – 81 (16%) – and Robotics – 70 (14%).

Following that, relatively populated were the Semiconductors (51, 10%), Transportation (39, 8%), Food (32, 6%), Space (28, 6%), and Security (28, 6%) tags. Companies can have multiple tags.

Table 4. Startups by industry, Dealroom data:

Number	Industry
201	Health
32	Food
39	Transportation
81	Energy
51	Semiconductors
28	Security
70	Robotics
23	Engineering and manufacturing equipment
28	Space

Additionally, Dealroom listed 104 (20%) companies´ main product or part of their innovation was Artificial Intelligence (AI) and/or Machine Learning (ML) technology. Whether AI or not, Dealroom has data on 154 database companies having a registered patent.

As Finest Scaleup project gives extra attention to gender balance in deeptech innovation, worth noting that out of 293 companies with Dealroom data about founders, 82 (28%) had a female founder.

Dealroom also offers data on company impact based on Sustainable Development Goals (SDG). Out of the Finest Scaleup database, the most common SDGs were (Table 5.): Climate Action #13 with 56 (11%) of companies, Affordable and Clean Energy #7 with 44 (9%), Responsible consumption and Production #12 with 43 (9%), Industry, Innovation and Infrastructure #9 with 39 (8%), Good Health and Well-being #3 with 37 (7%), Sustainable Cities and communities #11 with 26 (5%), and Zero Hunger #2 with 16 (3%).

Table 5. Startups by Impact Goals (Sustainable Development Goals), Dealroom data:

Number	Impact Goal
0	No Poverty #1
16	Zero Hunger #2
37	Good Health and Well-being #3
1	Quality Education #4
0	Gender Equality #5
9	Clean Water and Sanitation #6
44	Affordable and Clean Energy #7
1	Decent work and economic growth #8
39	Industry, Innovation and infrastructure #9
1	Reduced inequalities #10
26	Sustainable Cities and communities #11
43	Responsible consumption and Production #12
56	Climate Action #13
5	Life below Water #14
9	Life on Land #15
0	Peace, justice and strong institutions #16
1	Partnerships #17

Currently, according to Dealroom data, the 509 companies of the Finest Scaleup database employ more than 8600 employees (Table 7., Figure 1.). Around 1400 of them work in companies sized 200-500 employees, around 2200 are in companies sized 50-200, around 4000 are in companies sized 10-50, and 971 work in companies with 2-10 employees.

279 (55%) companies were in the Seed stage, while 192 (38%) were in Early Growth and 38 (7%) were in Late Growth stage (Table 6.) – which for the purposes of the project can be translated to 279 startups and 230 scaleups.

Table 6. Startups by Growth Stage, Dealroom data:

Number	Stage
276	Seed
192	Early Growth
38	Late Growth

Table 7. Employees by startup size, Dealroom data:

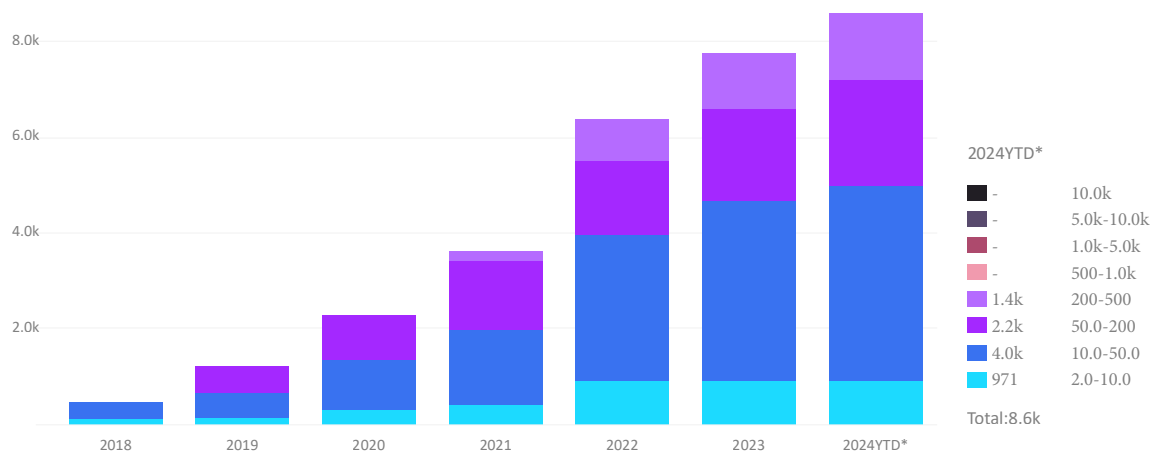| Size Range	2020	2021	2022	2023	2024
200-500	-	229	907	1.2k	1.4k
50-200	946	1.4k	1.5k	1.9k	2.2k
10-50	1.1k	1.6k	3.1k	3.7k	4.0k
2-10	311	440	893	955	971
Total:	2.3k	3.7k	6.3k	7.8k	8.6k

Figure 1. Employees by startup size, detailed breakdown for 2024YTD, Dealroom data

In the past 10 years (from 2015 to 2024 to date), a total of $2.14B has been invested in these 509 companies over 1023 funding rounds (Tables 8. and 9., Figures 3. and 4.). Of that $629.6M over 907 rounds were pre-seed and seed funding for startups (average round size $165k for pre-seed and $2M for seed), while $1.5B was Series A, B and C funding for scaleups (average round size $7.2M for Series A, $25M for Series B, and $52.5M for Series C). Investment peaked in 2022, due to a large amount of Series B and C funding.

Table 8. Amount invested by round type, Dealroom data, millions USD:

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024YTD
Series C (40-100M)	-	-	-	-	-	93.4	-	126	49.5	46.2
Series B (15-40M)	-	-	15.4	31	-	16.5	79.7	196	109	124
Series A (4-15M)	-	17.6	26.1	30.2	47.1	67.7	99.9	85.5	165	85.5
Seed (1-4M)	14.3	28.5	30.3	36.3	56.1	65.2	87.6	86.6	87.3	29.5
Pre-Seed (0-1M)	5.7	11.4	8.5	13	16.1	13.1	18.3	9.2	9	3.6
Total:	20	57.5	80.3	110	119	256	286	503	420	289

Table 9. Number of investment rounds by round type:

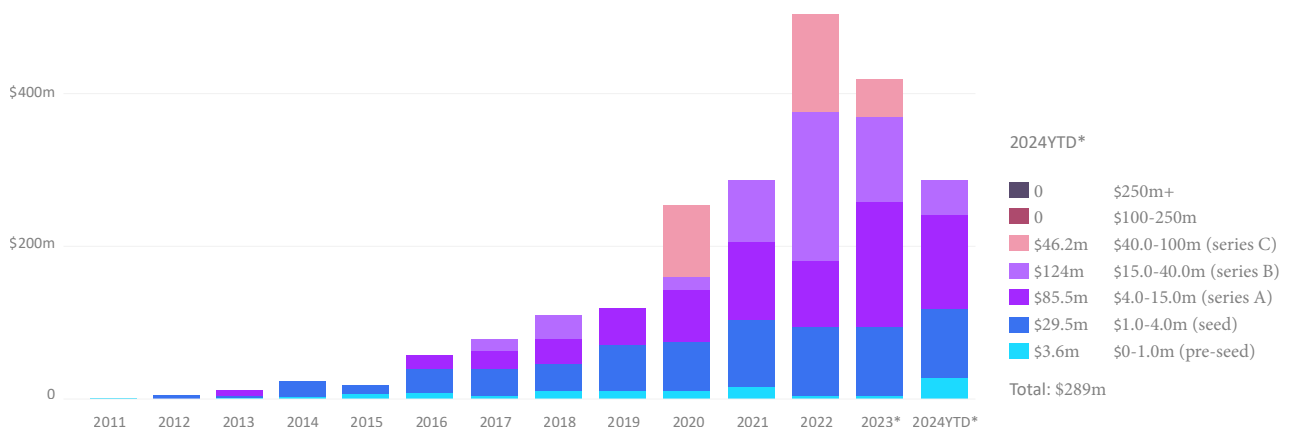|	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024YTD
Series C (40-100M)	0	0	0	0	0	2	0	2	1	1
Series B (15-40M)	0	0	1	1	0	1	3	7	5	5
Series A (4-15M)	0	2	4	5	6	10	14	11	24	11
Seed (1-4M)	7	12	11	19	28	32	47	41	42	14
Pre-Seed (0-1M)	32	53	56	69	99	77	89	61	80	38
Total:	39	67	72	94	133	122	153	122	152	69

Figure 2. Amount invested by round type, detailed breakdown for 2024YTD, Dealroom data, millions USD
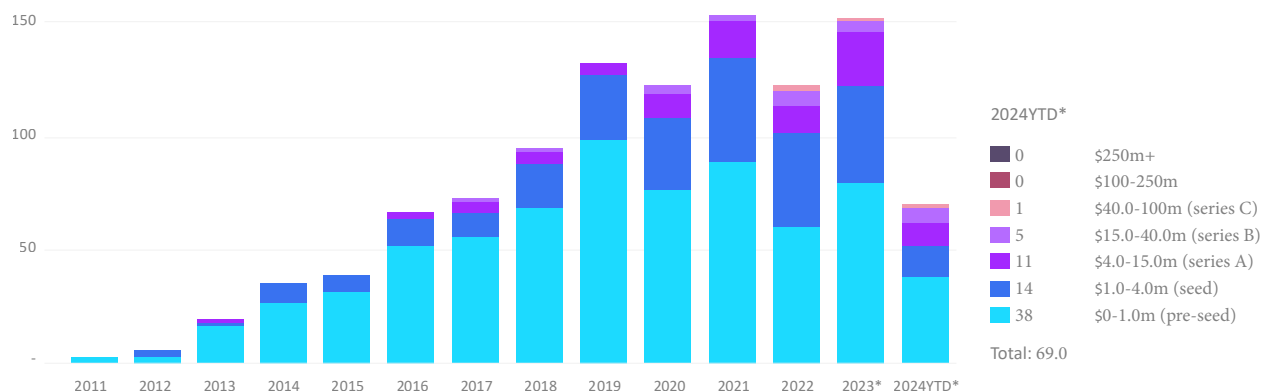
Figure 3. Number of investment rounds by round type, detailed breakdown for 2024YTD, Dealroom data

In these past 10 years, companies attracted 37% of investment domestically (e.g. Estonian startup receiving investment from an Estonian investor), 35% from investors who were based in Europe, 9% from USA, 6% from Asia, 1% from rest of the world and 13% from investors with no specified HQ location provided in Dealroom (Table 10.,

Figure 5.). Looking at the investment over the past 5 years, 47% of invested capital came from Venture Capital (VC) funds, 18% from Corporate investors, and 35% - from what Dealroom classifies as Other (Table 11., Figure 6.), which include Accelerators, Angels, Family Office, Government Non-Profit, etc.

Table 10. Invested amount by investor type, Dealroom data, millions USD:

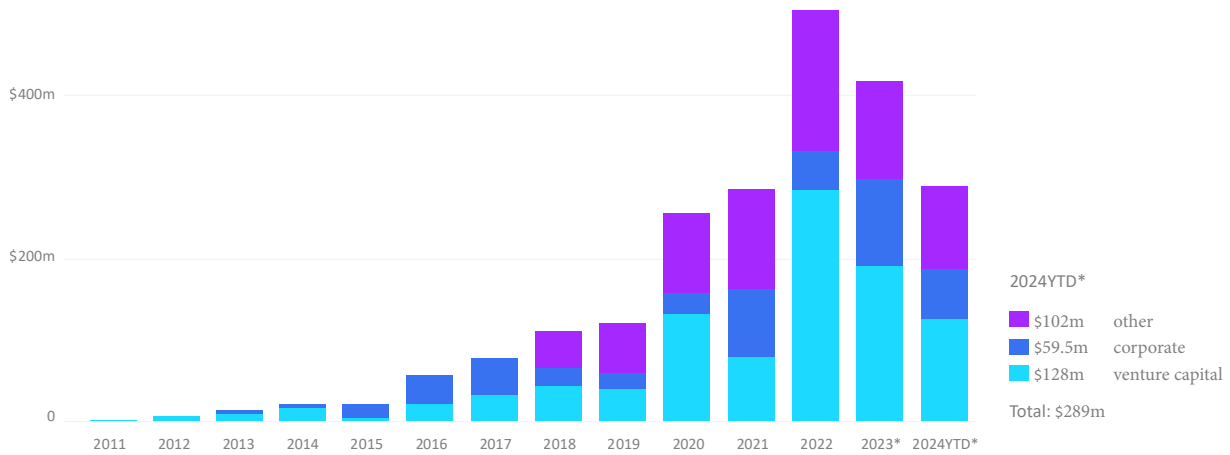|	**2020**	**2021**	**2022**	**2023**	**2024YTD**
Other	93.9	122	170	120	102
Corporate	27	81.5	45.5	109	59.5
Venture Capital	135	82	288	190	128

Figure 4. Invested amount by investor type, detailed breakdown for 2024YTD, Dealroom data, millions USD

Table 11. Invested amount by investor HQ location, Dealroom data, millions USD:

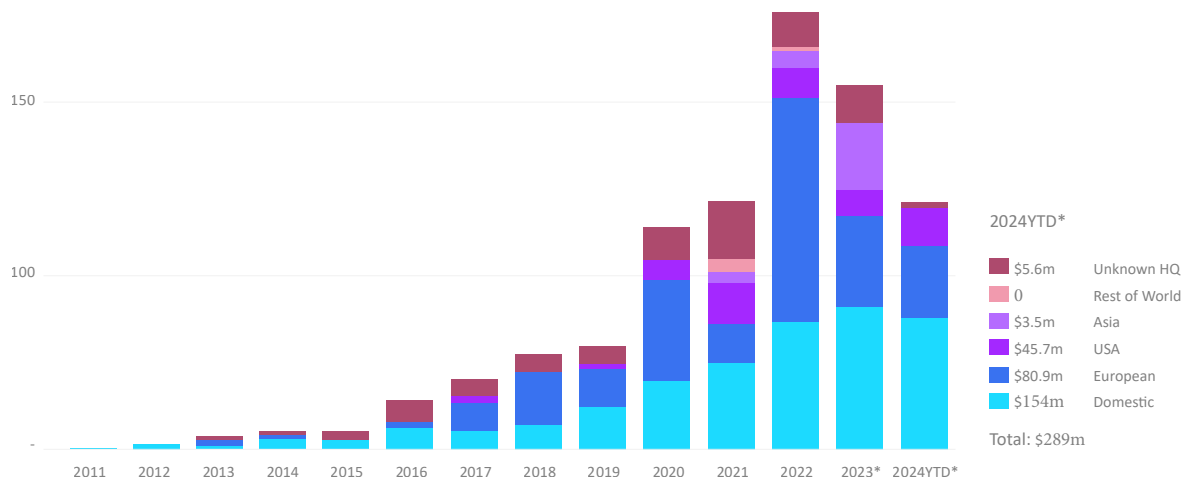|	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024YTD
Unknown HQ	5.8	24.1	18.7	19.6	19.0	37.7	65.8	38.3	43.6	5.6
Rest of World	0	0	0	0	0.625	0.320	13.5	7.1	0.399	0
Asia	0	0	4	0.09	0.165	4.7	15.0	18.0	75.1	3.5
USA	0	2.2	3.1	0.12	6.0	16.5	46.0	35.3	30.6	45.7
European	1.2	4.0	32.3	60.7	43.0	117	46.5	256	105	80.9
Domestic	12.9	27.1	22.3	29.9	50.4	79.8	98.9	149	165	154

Figure 5. Invested amount by investor HQ location, detailed breakdown for 2024YTD, Dealroom data, millions USD

The company's evaluation is shown in Figure 6. According to Dealroom, these 509 startups currently have a combined valuation of more than $6.7 billion.
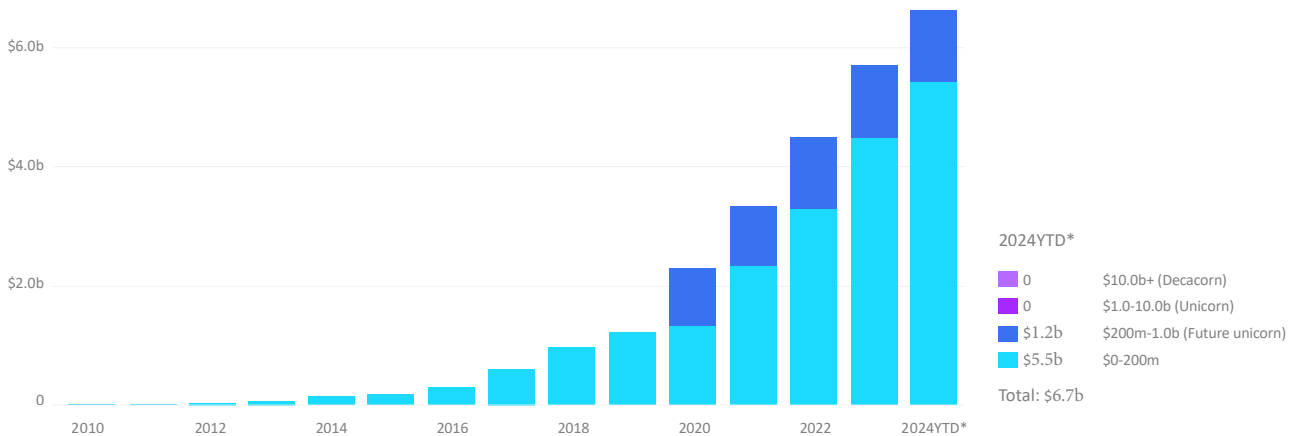

Figure 6. Enterprise valuation, detailed breakdown for 2024YTD, Dealroom data

Part II – Challenges and Best Practices for Supporting the Growth of the Deep Tech Sector in the BSR-5, Sonia Bazan, Krakow Technology Park

It is difficult to define deep tech

There are no universal criteria that can definitively determine what qualifies as deep tech. According to the XAnge European Deep Tech Compensation Benchmark 2024 report, deep tech stands out among other startups and scaleups due to its deep commitment to scientific research and long development periods, requiring significant investment and specialized talent.

In theory, it refers to technologies based on breakthrough scientific discoveries and advanced technological innovations. However, the line between deep tech and more traditional technology is often blurred. For example, technologies utilizing artificial intelligence or blockchain are labeled as deep tech, even if they don't necessarily rely on groundbreaking scientific achievements but rather on adapting existing solutions.[1,2] This leads to the overuse of the term by companies wanting to position themselves as technologically advanced. On the other hand, startups, often focused on practical applications, may not realize they are deep tech. During the interviews conducted in the summer 2024, one startup commented:

Anu Puusag, Tehnopol:
At this point, I can't clearly define where the line is drawn between an AI-based deep tech startup and one that isn't. We spent around four to five months with 50 people from various universities and ICT companies discussing the distinction between machine learning and AI, and when we can provide funding.[1]

Margaret Kanniste, EstBAN:
EstBAN is increasingly investing in deep tech, and recently, we made three investments, two of which were deep tech. However, the line between what is considered deep tech and other sectors isn't always clear.[3]

Although there is no consensus on defining what exactly qualifies as deep tech, the key factor remains that technology will succeed where there is potential for significant benefits from its implementation, and many technologies require advanced research and long development periods, which significantly increase the costs of their development.

To be honest, I'm not entirely sure if we qualify as deep tech. I haven't specifically asked myself this question before. If deep tech implies relying on fundamental research or having a PhD as a founder, then maybe we fit to some extent.

Deep tech can't always fit into predefined frameworks

Deep tech cannot be confined to rigid frameworks, as its development involves many unpredictable factors that can arise during research and development. Unlike other startup sectors, deep tech is based on new scientific discoveries and advanced engineering innovations, which require a long development cycle, during which the market can change. Additionally, deep tech startups face high technological risk, as there is uncertainty about whether the developed technologies will work in practice, as well as market risk related to the commercialization of the technology and its introduction to the market. As a result, operating in the deep tech sector cannot be fully predictable or planned according to predetermined standards. Many institutions and programs are not yet adapted to this reality.

Liene Briede, Riga Technical University:
EIT KICs' programs vary significantly from one to another. Their structures and methods differ, and EIT itself doesn't provide direct solutions—

it simply funds consortia or partners that apply for projects and implement them. When it comes to deep tech, these project-based approaches often don't work well because you can't fit every deep tech initiative into a fixed framework. For example, a six-month deep tech program may work for one team, but another team might need more time, especially for complex processes like gene development. [4]

Gabriela Konopka-Cupiał, Centre for Technology Transfer CITTRU:
Commercialization, like scientific research, involves a great deal of risk—sometimes we invest money without any return, especially with technologies requiring broad patent protection, such as in pharmaceuticals or biotechnology. Some universities do not take this risk, which inherently limits the potential of projects. The key need is a shift in mindset and allowing risk-taking. [5]

Deep tech startups and scaleups are still in the minority

The "Ecosystem Compass: Poland 2023" report states that there are over 3,300 startups operating in Poland, while the "Baltic Deep Tech Report 2024" indicates that there are over 1,900 startups in the Baltic countries combined. It is also estimated that there are around 4,000 startups in Finland.[6] However, there is no doubt that deep tech startups remain in the minority. In 2022, the Aper Ventures fund created the Central Europe Deeptech Startup Map, which included 265 entries from Poland, Hungary, Slovakia, and the Czech Republic. In the analysis conducted as part of the Finest Scaleup project, over 500 deep tech startups operating in the BSR-5 region were identified. Identifying these startups can sometimes be challenging. Nevertheless, the number of challenges facing Europe, and the world is immense, which is why we need more solutions based on deep technologies. One only needs to read the responses to the question about

which technology implementation respondents are most hopeful for, asked in interviews conducted during this project. It also seems that the history of a significant part of the BSR-5 region plays a role in the current situation.

Vaido Mikheim, Startup Estonia:
Identifying deep tech startups can be challenging. One issue is that we don't always recognize them immediately. Companies are not required to register as deep tech startups, so it might take one, two, or even three years before we can categorize them as such. [7]

Olga Barreto Goncalves, Startin.LV:
I would say that, first of all, it's natural that people who do science tend to genuinely enjoy it. However, when there's a push to commercialize their work or to focus on business, that's where they might start to

lose interest. It's inherently challenging to find someone who is both a scientist and an entrepreneur — a '2-in-1' person. People with this mentality are quite rare, in my opinion. Additionally, the past, particularly the Soviet era, plays a significant role. During those times, business and entrepreneurship didn't really exist, and I believe this has further reinforced the divide between science and business. [8]

The Finest Scaleup project will, in the next phases, focus on scaleups and scaleup wannabes. The Baltics Deep Tech Report 2023 states that startups progress into scaleups when they grow beyond 50 employees. Estimating the number of such entities in the BSR-5 region is difficult. In the aforementioned reports, there is no clear distinction between the number of startups and scaleups. In the startup and scaleup database prepared for the project, there are 192 companies in the early growth phase and 38 in the late growth phase, representing 45% of the entire ecosystem.

The "early growth stage" often corresponds with the transition to becoming a scaleup, but they are not exactly the same. A startup in the early growth stage is actively trying to scale, but only when it achieves sustained and significant growth over time can it be classified as a scaleup. It's important to remember, however, that Dealroom acquires a lot of information through scraping data on the internet, which can make some data unreliable, and causes younger startups and spinoffs with less digital presence to be more likely overlooked. According to the Polish Startups 2023 report, 13% of companies employ between 21 and 50 employees, while only 4% have more than 51 employees. Another key aspect is that deep tech companies find it harder to achieve scaleup status due to the significant time and resources required for research and development.

Challenges of Startups and Scaleups in the BSR-5 Region

Analyzing interviews conducted with local actors from ecosystems in the Baltic Sea Region countries—Estonia, Latvia, Lithuania, Finland, and Poland, collectively referred to as BSR-5, some challenges faced by startups and scaleups appear to be universal, regardless of the industry, and are among the most critical for further development.

Communication

Deep tech startups base their operations on advanced technologies, which are often difficult for those outside the industry to understand. Communicating these complex innovations in a way that is accessible to investors, customers, and partners poses a significant challenge.

Agnieszka Tokaj-Krzewska, the National Centre for Research and Development:
Another issue is "selling" the idea within the application – applicants often struggle to clearly explain what the project is about, what needs it addresses, and what problem it solves. Describing this within a limited number of characters is also a challenge. Projects must meet specific criteria, and demonstrating their strategic value can be difficult. [9]

Ahmet Köse, R8Technologies:
We have a strong value proposition for our clients. At the same time, trust and clear communication are equally important. Simply stating that we're a deep tech or AI company can sometimes make clients cautious. In order for us to help our clients optimize technical systems, we begin with building trust, which requires simplicity, transparency, and solid references.

Additionally, it is crucial to gather feedback from end users and understand their needs and expectations. [10]

An additional challenge is often the mindset of the founders themselves.

Izabela Bany, Aper Ventures:
I would start with changing the mindset of the founders, who are often tied to academia and not accustomed to regular press interactions like B2C startup founders. This is important because in science, publications often appear at the end of a long process, whereas marketing should build the story from the beginning, showing that the solution is trustworthy. (…) Additionally, in deep tech, it's hard to draw inspiration from others since the solutions are so new that there are no similar products to benchmark against. [11]

Effectively communicating the vision to investors and business partners is also crucial for deep tech startups. These companies must successfully convey the long-term potential of their innovations to investors, even though their products are often still in the development phase and not yet generating direct profits.

Regulations and certifications

The next of the major challenges for deep tech startups is dealing with regulations and obtaining licenses. Many startups face regulatory issues that are complex and often not adapted to rapidly evolving technologies. Deep tech startups require specific support in navigating these complex regulations, as their activities involve advanced technologies that are not always fully covered by existing legal frameworks. Another challenge is obtaining the necessary licenses, which often requires collaboration with various administrative bodies. The Endeavor Insight Mapping Poland's

Tech Sector report indicates that changing regulations, interpretative ambiguities, and a complex tax system are also significant obstacles for smaller companies. All of this takes time and increases costs.

Vaido Mikheim, Startup Estonia:
We are working on simplifying this process to provide a "fast track" for bringing in employees. This issue has been on our agenda for over a year. While some concerns are within our control, others are raised by companies and are beyond our influence. For example, issues related to health tech, food tech, or novel foods often involve regulations from the European Food Safety Authority. Although we can voice our concerns in Brussels, we do not have the authority to change these regulations directly.[7]

Anonymous startup operating in the financial industry:
When it comes to innovative companies that require regulatory permits, securing those permits is a significant challenge. For large corporations with deep pockets, it's one thing to wait two years for a permit. But for deep tech startups, or any startup with limited resources, this can be a major hurdle. [12]

Jekaterina Romanova, PrintyMed:
For our membrane for organ-on-chip solutions, we anticipate starting sales in about a year. However, for other more regulated medical applications, it will take at least three years before we can begin sales. The regulatory landscape and the need for thorough preclinical studies contribute to this extended timeline.[13]

Access to talent

In turn, both deep tech startups and scaleups face challenges in recruiting and retaining qualified employees, particularly in the face of competition from larger industrial companies. The lack of access to suitable human resources, especially for C-level and engineering positions, is a key challenge. The Endeavor Insight report Mapping Poland's Tech Sector indicates that, although Poland has a deep pool of talented engineers and developers, hiring them is becoming increasingly costly due to global competition. A similar issue is present in Finland.

Jussi Sainiemi, Voima Ventures:
Aside from funding, there are other topics to consider, not just related to deep tech. One major issue is the competition for talent. Attracting skilled workers, especially from

abroad, is a constant challenge. In Finland, the startup community has been working to make it easier for foreigners to move here with their families and to make Finland more attractive to international talent, but there's still a lot of work to be done.[14]

This issue seems particularly significant in the Baltic countries, which are small in terms of both population and economic size.

Vaido Mikheim, Startup Estonia:
(...) After capital, the next challenges are human resources or finding the right people, and regulatory issues. This information comes from our latest startup survey conducted in December last year (2023), so it's relatively recent. [7]

Access to contacts

Access to mentors, investors, and networks is crucial for the development of startups and scaleups, especially deep tech companies. Reaching the right people is essential not only at the beginning of the business journey to showcase their solutions but also at later stages, such as international expansion,

where understanding the specifics of different markets is key. For deep tech companies, the support of industry specialists is equally important, as they can help identify potential applications for developing technology.

Marta Jasiewicz, pharmdriver:
Breaking into a market where connections are key requires a lot of patience, as the pharmaceutical industry is rather distrustful, and trust has to be earned. If these startup programs had partnerships with organizations like the Polish Cardiac Society, it would make things much easier. Faster access to key opinion leaders would help because, when entering this market, you have to build the image of a credible, high-quality company, which is very challenging.[15]

Ahmet Köse, R8Technologies:
Entering different countries presents unique challenges. For example, doing business in Poland or Spain requires understanding how commercial buildings operate there. Knowing the technology, people, and expectations is essential. Connecting with local experts and creating pilot projects can help bridge the gap, especially when reaching decision-makers in a B2B context. Support in these areas would be invaluable.[10]

Jekaterina Romanova, PrintyMed:
The most valuable element of the Health Founders Estonia accelerator program for us was our mentor, David Yakobi, an experienced cardiac researcher from Israel. He played a crucial role in helping us develop our artificial heart valve prototype and refine our concept.[13]

Difficulties in raising capital

It will come as no surprise that deep tech startups are capital-intensive, especially in the early stages of development, due to long research and development cycles. Startups often try to patch their budget by participating in grant projects or startup competitions, which sometimes can be time-consuming and distract from focusing on product development.

Jekaterina Romanova, PrintyMed:
One of the most effective strategies in PrintyMed's development has been to apply to as many programs and funding opportunities as possible. This approach increases the chances of securing necessary resources, funding, and support. The more applications you submit, the higher the likelihood of receiving benefits, whether it's funding, mentorship, or other forms of assistance. It has also given us significant visibility and recognition, helping us become well-known and regarded as one of the most promising startups in Latvia.[13]

Companies in later stages of development also do not have it easy in this aspect. According to the Polish VC Market Outlook 2023 report, the decline in co-investments and the reduced presence of international funds in the Polish ecosystem are linked to the global crisis in the venture capital market. The report also notes that raising rounds above EUR 5 million often requires the participation of foreign investors, making it challenging for Polish companies to secure follow-up investments.

Sławomir Olejnik, Deep Tech CEE:
The market lacks investors who have the knowledge to develop deep tech projects. Most invest in a portfolio manner, without a deep understanding of the technology. A good example of a specialized fund is Vigo Ventures, powered by the company Vigo System and the large Warsaw Equity Group fund, which strategically invests in technologies such as photonics and electronics, knowing where the market is and why it's worth investing in.[16]

Kasparas Jurgelionis, Iron Wolf Capital:
Most funds focus on seed and pre-seed, with an increasing number of accelerators also playing a strong role. In the Baltics, none, apart from us, actively market themselves as deep tech and AIfund; they typically label themselves as generalists. This makes it difficult to determine how much capital is specifically allocated to deep tech.[17]

Jussi Sainiemi, Voima Ventures:
I would say that early-stage, especially seed-stage funding, is relatively well-covered.

Of course, there's always room for more capital in that area, but I think it's doing fairly well. However, these companies tend to require significant investments over time, and in Finland, we don't have many large growth-stage funds. (…) I'd say it's not just a local issue, though—it's more of a European challenge.[14]

Rūta Grėskaitė, Startup Lithuania:
We receive government support directly for the deep tech sector, along with several local funds that only invest in deep tech. Foreign investors also play a role. Is this funding enough? Similar to Poland, where there's an issue with post-seed investment, we face challenges in scaling startups after the initial phase.[18]

Public funding for startups and scaleups in the Baltic Sea region plays a crucial role in developing the innovation ecosystem.[19,20,21] However, it is important to recognize that when applying for funding, a startup must be able to clearly communicate its vision. Another issue is that some funding institutions do not provide 100% of the required support, meaning the company must secure the remaining funds on its own.

Agnieszka Tokaj-Krzewska, the National Centre for Research and Development:
I think the problem is the applicants' approach to bureaucracy. We manage public funds (including those from EU programs), so costs must be eligible according to the regulations, which can be challenging. (…) The biggest challenge is that R&D projects are unpredictable, often leading to delays and contract amendments. Sometimes changes are needed in the projects, such as replacing an unavailable material. These are high-risk projects. They are carried out over a longer time frame, while the market keeps evolving.[9]

Jaana Rantanen, Business Finland:
We never provide 100% funding—companies need to show that they have their own resources, as our funding typically covers 50% to 75% of the project costs. While we are willing to take a high risk on whether the technology works, we don't take the risk that the company lacks the funding to complete the project. That's how we operate.[22]

Managing expectations

One of the biggest challenges that deep tech startups and scaleups face is effectively managing expectations—both within the team and in relationships with investors and clients.[23] These startups often work on long-term, complex projects that require flexibility, resilience to stress, and efficient communication. It is crucial to understand what is expected from investors and what they expect in return from the startup. The same applies to employees, who need to be aware of the goals and challenges related to the project.

Additionally, effective stress and pressure management is key to success in technology startups. The complexity of the projects and frequent market changes demand flexibility and adaptability from the team. Proper psychological support, along with negotiation skills under investor pressure, can play a decisive role in the success of the venture.

Marta Jasiewicz, pharmdriver:
The moment of reaching the break-even point

is very stressful because everything usually gets delayed, and nothing goes exactly according to plan. In such moments, mental support is extremely important because it's a significant psychological burden. No one will do your job for you, but support can help you not give up.[15]

Abhishek Kumar, Ekotekt:
Being a startup founder is really tough, and it's not about whether people are good or bad. Some can be excellent managers or motivational leaders, but that doesn't mean they are fit to be cofounders. What I've learned is that a cofounder needs to have resilience— the ability to try, fail, learn, and keep going, with motivation and passion for the project. Believing in what we're doing is key. Many of the people I've worked with are incredibly talented and would make great employees, but not necessarily great cofounders.[24]

Best practices for Supporting the Growth of the Deep Tech Sector in the BSR-5

The driver

Estonia has set a goal of having 500 deep tech startups by 2030, a target that initially originated from a politician's statement, which later evolved into a national internal goal. Currently, there are around 160 deep tech startups in Estonia, highlighting a significant gap to fill. To achieve this objective, Startup Estonia, in collaboration with the Estonian government and various partners,

including research and academic institutions, has developed an Action Plan outlined in the Startup Estonia White Paper 2021-2027. This plan is part of a broader national strategy aimed at strengthening Estonia's startup ecosystem, with a particular focus on deep tech and technological innovation. It outlines five key goals:

Strengthening Estonia's Startup Ecosystem – Through various events and initiatives, including training, marketing strategies, and removing regulatory barriers. The goal is to make Estonia one of the best places in the world for startups.

Training Startups and Ecosystem Members – Addressing areas where they lack knowledge and skills to achieve international business goals.

Educating Local Investors and Attracting Foreign Investors – The aim is to increase smart investments and launch new acceleration funds, which will bring more capital to the local ecosystem.

Eliminating Regulatory Barriers – Striving to create a friendly environment for startups, investors, and employees by simplifying regulations, such as introducing the Startup Visa.

Promoting a Startup Mindset – Increasing innovation in the academic sector, fostering research-driven startups, and supporting the creation of patents and intellectual property protection.

Moreover, as part of the Deep Tech Sandbox project, jointly carried out by key organizations supporting deep tech in Estonia, such as Tehnopol Startup Incubator, Estonian Business

Angels Network (EstBAN), Tallinn University of Technology (TalTech), and Startup Estonia, 10 recommendations were developed based on the experiences of the Copenhagen, Cambridge, and Eindhoven regions, aimed at fostering the growth of Estonia's deep tech ecosystem.

One of these recommendations is a demand from the government for universities to commercialize science, along with the understanding that the entire ecosystem, including the public sector, is responsible for contributing to the growth of new science-based companies. Only through this coordinated effort can science-based companies thrive and contribute to the broader economy.

Gabriela Konopka-Cupiał, Centre for Technology Transfer CITTRU:
No, we don't have formal KPIs imposed externally. Internally, we set our own goals and have developed our own system. The university and the ministry do not require specific indicators from us, unless they are related to projects we are involved in. In projects, there are often set requirements regarding the number of patent applications, startups, or collaborations

with businesses. If these are not project-related requirements, the university doesn't impose such goals. However, our role is to report commercialization efforts and generate revenue, which is taken into account in the evaluation of the quality of scientific activities.[5]

Liene Briede, Riga Technical University:
The regulations aren't very supportive at the moment. Because of this, we haven't kept a detailed count of commercialization cases. Without a proper system like a database to track and report to the ministry, it's hard to keep track of the exact numbers. We've set a goal to have at least three spin-offs per year starting next year, which I believe is quite ambitious.[4]

Sławomir Olejnik, Deep Tech CEE:
We have a chance to catch up, but we need wise partners, systemic government support that implements what we are advocating (not their own ideas), funding focused on basic science in selected niches, and many other solutions that the ecosystem has been recommending to various parties for years.[16]

Managing IP

Given the high R&D costs and the long development cycles, securing strong IP protection is essential for ensuring that companies can monetize their innovations.[25] The strategic document Startup Estonia White Paper 2021-2027 discusses the importance of intellectual property (IP) protection and commercialization. It emphasizes that the state should support the growth of science and R&D-driven startups and scaleups by promoting IP protection and the creation of patents. Many aspects of transferring rights from universities to companies still require regulation, and it is a time-consuming process. There are also differences between individual countries and even universities. However, it seems achievable, provided that the necessary resources are clearly identified, and academic and business activities are not informally mixed. One of the leaders in this area is Aalto University, which in 2023 processed 137 invention disclosures, filed 71 patent applications, and

completed a total of 18 technology or knowledge transfers to companies.[26]

Liene Briede, Riga Technical University:
The first challenge we face is the regulation surrounding intellectual property and its policy. The current rules are too strict and not conducive to spin-off creation. When everything is owned by the university, it makes these companies less attractive to investors, who are looking for assurance that the intellectual property will eventually stay with the company. This creates a dynamic where the university becomes an awkward, long-term partner in the business.[4]

Gabriela Konopka-Cupiał, Centre for Technology Transfer CITTRU:
Regarding infrastructure or research outcomes, we usually grant licenses. We have cases where intellectual property has been protected,

resulting in a patent or patent application, which was then licensed or transferred to a startup. There are also cases where no patent was filed, but knowledge was generated, which we consider know-how, and we also license it to startups. It's important to clearly define what we have and what the startup needs, and then make it available on commercial terms. If a startup requires access to university infrastructure, it also has that option.(…) If the startup is based on the university's intellectual property, there is no problem – it's enough to name the resource and transfer it to the company. (…) There are also conflicts of interest, especially when researchers try to combine

academic and business activities. Often, researchers who developed something while working at the university do not recognize that the institution has rights to those patents, which can lead to conflicts, particularly in interactions with investment funds that don't always verify the legal status. [5]

Jekaterina Romanova, PrintyMed:
We also have an exclusive licensing agreement with the Latvian Institute of Organic Synthesis, where Kristaps is from, for the intellectual property. However, they are not part of our company's cap table and are not involved in our startup beyond the licensing agreement. [13]

Addressing researchers' lack of business experience

Researchers often lack the appropriate experience in managing businesses, which leads to difficulties in turning research results into commercial products.[5,25] And this seems to be one of the biggest problems in commercialization. In Poland, there is an option for a research employee to take over the IP rights they report to the university. They have 14 days to do so and can buy the IP for a symbolic amount, which is 5% of the average salary, regardless of the research costs. However, researchers rarely take advantage of this option. When the university decides to forgo commercialization and transfers the IP rights to researchers, they often do not pursue independent actions. Although regulations were introduced to give more freedom in managing IP, so far it has not resulted in greater involvement of researchers in commercialization efforts. Researchers often view companies as just another scientific project, relying on support from the university. The composition of the team is particularly important, especially in the early stages, where investors place significant emphasis on this aspect. While the team remains crucial in later phases, as the technology and business model are validated, the risk associated with the team gradually decreases.

Jussi Sainiemi, Voima Ventures:
Often, teams from academia are strong in scientific research but lack commercial

experience, which is crucial for us to consider an investment. We often advise these teams to find a co-founder with startup or scale-up experience who understands what next-stage investors require and how to build relationships with customers and partners. [14]

Anu Puusag, Tehnopol:
One of the challenges universities face is that many deep tech ideas come from professors or researchers who may be hesitant to pursue business ventures out of fear they might have to leave academia. To address this, we're working on ways to form teams around these ideas, allowing the researchers to remain in the university while building the business with additional talent. Often, the individuals who come up with these ideas are not business-oriented, so it's essential to bring in others who can help develop the business model. [1]

In the BSR-5 region countries, there are also interesting solutions that address this problem. One of them is Commercialization Reactor from Latvia. It is a platform that brings together scientists and entrepreneurs to co-create deep-tech startups. Entrepreneurs handle business leadership, while scientists focus on their core competencies to develop products or services. Over 10 years, this model has led to the creation of over 100 science-based startups. One of their

initiatives is the Ignition Event, where scientists present their solutions and potential applications.

Jekaterina Romanova, PrintyMed:
At the Ignition Event, Kristaps's presentation on artificial spider silk and its potential for creating artificial organs immediately caught my attention. My previous experience includes a startup producing T-shirts for posture correction and another focused on 3D bioprinting artificial bone grafts. (...) Kristaps's idea aligned perfectly with my interest in medical applications, especially artificial organs.[13]

An example from Poland is the Łukasiewicz Accelerator, an initiative aimed internally within the organization. Its main mission is to intensify indirect commercialization within the Łukasiewicz Research Network by creating capital companies in the form of technology startups. The idea creators

go through an incubation and acceleration process, learning how to run a business.

In Estonia, the University of Tartu has created UniTartu Ventures, which simplifies the journey from research to market by offering mentorship, strategies for intellectual property protection, and support in preparing startups for investment. Through an 'IP-for-equity' model, they invest in university research, ensuring that innovative ideas receive the backing needed for success.

Meanwhile, in Lithuania, Baltic Sandbox Venture operates an incubation program that provides grants to talents with a scientific background to support the development of their business projects. Additionally, it invites them to participate in a 7-week fast-track MBA program focused on how to create a venture-grade startup.

Nurturing deep tech ecosystem through education

Most likely, the majority of deep tech startups will emerge from universities.[7,14,23] This is why educating students is so important, as it develops the skills needed to effectively transform their ideas and innovations into real products and services.

Liene Briede, Riga Technical University:
Our goal is to be at the heart of the innovation ecosystem, and we've worked hard to achieve that through a systems approach. There are many elements involved, from working with

different support instruments to motivating our scientists and engaging our students in entrepreneurial activities. We provide prototyping facilities that are crucial not only for our own startups but also for the entire Latvian startup ecosystem and even beyond.[4]

Agnieszka Tokaj-Krzewska, the National Centre for Research and Development:
We've launched the "Universities of the Future" project (financed from EU Funds), where students can earn credits by completing their own research projects. The pilot was successful, and now the project will be implemented nationwide. It's important that students pursue what inspires them, but they must also look at their ideas from a market potential perspective.[9]

Vaido Mikheim, Startup Estonia:
One noteworthy initiative is the Entrepreneur in Residence programm which is jointly funded by University of Tartu and us. This program addresses the need for business expertise at universities and research teams by bringing in experienced entrepreneurs and managers to work part-time with these teams. This effort is crucial because, as we aim to reach 500 deep tech startups, a significant portion of this pipeline, about 80%, originates from universities.[7]

It's especially important to focus on education for women in both entrepreneurship and STEM. According to the deep tech database created as part of the Finest Scaleup project, out of 293 companies with available founder data, only 82 had a female founder. Women often encounter unique challenges like being more risk-averse, handling unequal family duties, and not having enough visible role models. These factors can discourage them from starting startups, particularly in deep tech. With targeted education, women can gain the skills, confidence, and support they need to overcome these obstacles**.**

Ieva Šūmakarytė, Women Go Tech:
We are continuously evaluating the market landscape and adapting our strategies to better support women in tech. Currently, we have identified the issue of underrepresentation of women in AI, which is widening the gender gap. Therefore, we are intensifying our efforts in this area by developing new programs and initiatives aimed at raising awareness and increasing usage of AI tools among women.[27]

Industry focus

Initiatives such as incubators and acceleration programs are essential in helping startups overcome barriers related to lack of experience, funding, and market access. In conversations with startups, the need for industry-specific support is becoming increasingly apparent. This type of support is particularly valuable because it not only facilitates networking but also helps startups verify the specific market they plan to enter. Each industry has its own unique challenges and regulations, and a deep understanding of these can be crucial to a young company's success. As a result, targeted industry support significantly increases the chances of success for startups, especially in sectors where legal and regulatory requirements are complex.

Jekaterina Romanova, PrintyMed:
Having participated in many programs across Latvia and Europe, we've encountered a lot of general advice. However, the focused and specialized information provided by Health Founders was particularly beneficial for our needs as a medical startup, distinguishing it from the more generic guidance we had received elsewhere.[13]

Ahmet Köse, R8Technologies:
We constantly participate in conferences, events, and challenges to improve our technology and business. We choose events that offer substantial benefits, not just for marketing but for gaining insights from end users, potential clients, and partners.[10]

Marta Jasiewicz, pharmdriver:
Above all, it's about building a network and reaching the right people, because someone has to learn about our solution. What we need is a change in awareness regarding certain standards, such as checking drug interactions and avoiding poor pharmacotherapy, which generates high costs for the system.[15]

Angelika Popławska, Krakow Technology Park:
In the context of accelerators that collaborate with partners, where the acceleration project concludes with a product or service pilot in a real-world environment, creating industry-specific accelerators seems the most obvious approach. This allows for delivering solutions in designated areas and at a technological development stage that enables relatively

quick validation and implementation. Industry specialization of the accelerator leads to greater knowledge and expertise regarding technologies, technological challenges, partner expectations, and implementation pathways. It is difficult to expect one team to be equally specialized in startups and technologies such as medtech and fintech, for example. The acceleration of deep tech startups, due to both the innovativeness of the solutions and often the need for research, requires a much longer timeframe and, thus, a different type of accelerator. In our Industry 4.0 programs, we sometimes accelerate startups whose solutions address very complex technological, engineering, or scientific challenges and create breakthrough, hard-to-replicate products. However, their participation requires greater openness and engagement from partners

as well as a high level of discipline and time commitment from the founders.[28]

Not only are acceleration programs becoming more specialized, but also investment funds. Since life sciences are one of the key pillars of Lithuania's innovation ecosystem, Baltic Sandbox Ventures focuses on supporting both deep tech and life sciences. On the other hand, Iron Wolf Capital, while also investing in deep tech, places a strong emphasis on AI. In Poland, Vigo Ventures specializes in supporting photonics solutions. Meanwhile, in Estonia, Enterprise Estonia has an investment arm, SmartCap, which matches private and public investments and manages various funds, including the Deep Tech Fund, the Green Tech Fund, and, more recently, the Defense Tech Fund.

Cross-sector collaboration

For startups to transition from the technology development phase to commercialization, it is essential to create an effective ecosystem in which they can grow and succeed in the market. This is related to the collaboration and involvement of multiple actors. [25,29,30] There are currently stereotypes that universities are not ready to collaborate with businesses, while others believe that it is businesses that are not ready to collaborate with universities.[5] One of the most important aspects of this collaboration is the early involvement of funds and companies in defining research questions, so that research conducted at universities better aligns with market needs. Currently, research is often carried out based on researchers' assumptions, which leads to results that do not always reflect the real needs of industry. Funds can also play a crucial role in helping universities and startups find the right managers to oversee the commercialization of inventions.

Gabriela Konopka-Cupiał, Centre for Technology Transfer CITTRU:
Greater involvement of funds and companies in defining research questions and adjusting the research process would be valuable, although

flexibility in conducting research is limited by grant agreements. Collaboration at earlier stages, such as providing feedback on projects or suggesting additional studies that won't increase costs but will offer answers the business needs, would be very helpful.[5]

Liene Briede, Riga Technical University:
In regular startups, you typically have a clear problem, business case, and solution. However, in deep tech, you often start with a solution and need to find the problem or market, if it even exists. This is why pre-discovery investment is crucial—to test the concept and build a prototype. At the pre-discovery stage, having the right environment and support is vital. There's a shortage of spaces for deep tech startups to build and test prototypes, and access to industry partners with infrastructure is essential.[4]

A rather unconventional solution is currently being implemented in Lithuania, involving universities in investing in an investment fund, which represents a shift from the traditional role of universities. In February of this year, Warsaw University of Technology took a similar

step by establishing the Warsaw University of Technology Investment Factor, focusing on deep-tech companies created by teams from Polish universities.

Liene Briede, Riga Technical University:
The fund will be established with the involvement of four science universities in Latvia, along with external investors. Essentially, the university will invest in the fund, which will then invest in startups, rather than the university directly funding the startups itself. This structure helps to avoid conflicts of interest, especially if a startup is connected to a student or professor from the university. Having a separate entity with an investment council ensures a transparent and fair decision-making process regarding where to invest.[4]

Discussing and finding common ground, as well as working to solve existing problems through consultations with representatives from various sectors, is crucial because it is the only way to develop solutions that account for diverse perspectives and needs. Each sector—whether government, universities, private companies, or research organizations—brings unique experiences and challenges to the table.[32]

Sofija Martinsone, Investment and Development Agency of Latvia:
We've created groups for each of these five areas, involving relevant organizations, such as government ministries, leading educational and research institutions, and associations representing companies in these fields. These groups come together to strategize the future of these deep-tech areas, making recommendations on what should be improved, what changes might be needed, and even suggesting ideas for legislation.[31]

Vaido Mikheim, Startup Estonia:
We have an informal task force called the "Deep Tech Squad," which includes representatives from science parks, top universities, and the Ministry of Economic Affairs. This group meets bi-monthly to discuss various issues, including legal challenges faced by academics with dual roles and the process of transferring intellectual property from universities to companies.[7]

Although there are still many challenges in supporting deep techs, it is clear that all parties are willing to collaborate, and this is already yielding the first results.

Building networks

Building international networks in the deep tech sector is essential as it enables access to global markets, international capital, and the exchange of knowledge and technology. Startups can expand into foreign markets more rapidly, gain a deeper understanding of local needs and regulations, and attract investors from around the world. Furthermore, international networks help in assembling global teams, which is crucial in a sector that demands specialized expertise.[16,32,33,34]

Sławomir Olejnik, Deep Tech CEE:
To internationalize the Polish ecosystem, we need to attract people from abroad and motivate our stakeholders. Innovation is often driven by immigrants, so it's worth creating programs for international PhD students or Erasmus participants, encouraging them to start businesses in Poland or to collaborate on deep-tech startups with scientists from other countries. Some of these startups could be registered in Poland, some in other countries, and ultimately they could operate in both. Startups that develop an international organizational culture are more likely to expand globally. Many deep tech companies could be founded through international co-founders, which opens up opportunities for funding from various sources.[16]

Ahmet Köse, R8Technologies:
Even though our HQ is in Estonia, our office language is English. We value diversity and have a team with over ten nationalities, which means various languages, cultures, and backgrounds. Additionally, 35% of our team holds PhD degrees, bringing a deep understanding of novelty and innovation. Our best practices include a diversity-oriented mindset, having experts on the team, being agile and open to feedback, continuously developing our product, and, most importantly, enjoying the work we do.[10]

The BSR-5 countries host many internationally recognized events, such as Deep Tech Atelier, the largest deep tech event in the Baltics, Deep Tech CEE Summit held in Poland, NORDEEP Nordic Deep Tech Business Summit, the leading deep tech summit in Northern Europe, and widely known events connecting startups and investors, such as Slush and Latitude59. On the other hand, more specialized events like Life Sciences Baltics focus on the life sciences and biotechnology sectors, supporting innovation in these fields. All of these events, with their international character, not only facilitate the exchange of knowledge and experience but also help gain recognition, establish partnerships, and secure investment capital. However, there is also a clear need to build local communities and share practical insights and lessons from deep tech startup founders, as well as to foster networking opportunities.

Kasparas Jurgelionis, Iron Wolf Capital:
What Iron Wolf does, for example, is we organize a bimonthly series of community gatherings called Deep Tech Breakfast. These events bring together founders, investors, and angels active in the region and interested in deep tech topics across four or five cities in the Baltics where the major startup hubs are located. The attendance tends to be in the hundreds, showing a strong need for deep tech founders to build a community.[17]

Abhishek Kumar, ekotekt:
I would say that the most valuable part of this program is meeting other co-founders who face similar challenges. Often, someone has already solved a problem you're dealing with, so networking with them can save a lot of time and money. Due to COVID, most interactions moved online, but now things are improving. Having the chance to sit down for lunch and discuss issues face-to-face with other founders is incredibly helpful.[24]

Investment landscape

The Baltic deep tech sector has experienced the fastest growth in Europe, outpacing many global regions. Since 2019, the combined enterprise value of deep tech startups has tripled[2]. In the Baltic Deep Tech Report 2024, it can be read that the increasing share of AI and deep tech startups in the region accounts for 20% of the ecosystem's total value, with a combined enterprise value of €6.8 billion. Although the market has seen significant growth in the value of deep-tech startups in the last 5 years, securing larger funding rounds at later stages of development remains a key challenge. There are also early initiatives that address this problem.

Vaido Mikheim, Startup Estonia:
This autumn, we're organizing a semi-open event to attract late-stage investors. We're partnering with TechTour and inviting funds that invest in late seed and Series A or later investment rounds, with tickets of €3 million or more, to visit Estonia. We want to make Estonia more appealing to investors and encourage them to evaluate local opportunities.[7]

According to the Deep Tech Study Finland 2023, by October 2023, Finnish deep tech companies had raised €180 million, which is a 42% drop compared to the previous year, partially due to natural funding cycles and fewer newly founded startups. A key issue for Finnish companies is the lack of investors capable of leading large funding rounds, resulting in prolonged fundraising processes. However, the sector continues to attract the attention of international funds, particularly in areas such as energy and quantum technologies, offering hope for further development.

The report VC Transactions on the Polish Market in Q2 2024 indicates an increase in the value of venture capital transactions in Poland, which amounted to PLN 896 million in the second quarter of 2024. This is the best result since the end of 2022, despite a relatively low number of transactions – only 38. A significant transaction was the ICEYE round worth PLN 372 million,

as well as investment in Quantum Innovations, valued at PLN 41 million. Despite the increase in value, the VC market is struggling with a lack of funds for seed and pre-seed rounds, which is expected to improve after the launch of the Bridge Up program. Until now, deep tech has been perceived as a risky sector, and many companies have relied on funding from EU grants or national support programs. However, more and more venture capital funds and business angels are recognizing the potential of this sector, and more corporations are investing in deep-tech startups. Of course, there are also international tools supporting the development of innovative companies, such as the EIC Accelerator, which offers significant financial support for deep-tech projects at the European level. This program is very attractive for startups as it allows them to obtain large grants and equity investments for the further development of breakthrough technologies. However, to qualify for the program, a company must have a technology in an advanced stage of development (at least TRL 5/6) and a clear commercialization pathway.

Liene Briede, Riga Technical University:
The EIC Accelerator is a strong instrument that has filled a significant gap, but it is more suited to later-stage projects, often requiring an investor already in place. We must to take local action to prepare teams better before they can access larger instruments like the EIC.[4]

Clearly communicating a fund's strategy benefits not only the fund, giving it the chance to stand out in the market and build a pipeline for future portfolios, but also startups, which can better prepare for meetings with the fund. While updating the database of funds investing in deep tech in the BSR-5 region, it was found that nearly 40% of funds do not provide easily accessible information on ticket sizes or the industries they support. In many cases, funds have a "jobs" section on their website, assisting with recruitment for startups in their portfolios, which is a good practice.

Izabela Bany, Aper Ventures:
The most important thing is clearly communicating their (VC funds') offer – which industries they support, the amounts they invest, and the additional support they offer (…) Assuming that every startup carefully prepares for the first conversation with a fund, the fund should publish content with the aim of providing as much information as possible. This approach can yield many benefits and is something we also practice.[11]

The stakeholder database for the BSR-5 region, created for the project, includes 55 VC funds that invest in deep tech, primarily at the pre-seed and seed stages. However, nearly half of these funds declare their readiness to invest in Series A rounds, and 13 of them are open to invest in Series B rounds. The database also contains 60 growth partners, including accelerators and institutions that provide financial support in the form of grants. The database will be regularly updated throughout the duration of the project. The global database of VC funds created by Hello Tomorrow includes nearly 500 funds that have declared an interest in the European region and deep tech, and have completed at least one investment in this sector.

Public funding

In 2023, according to the Latvian Startup Report 2023, the Investment and Development Agency of Latvia invested a total amount of EUR 1.624 million in 31 startups, while also providing additional support worth EUR 2.228 million through the Startup Law tool, which includes tax reliefs and talent co-funding. The total value of public support in Latvia has exceeded EUR 5.5 million. Meanwhile, the Polish Startups 2023 report indicates that 23% of startups have benefited from funding provided by the National Centre for Research and Development (NCBR), also mentioned in this report. Additionally, 16% received funding from the Polish Agency for Enterprise Development (PARP), and 8% from the Polish Development Fund (PFR). In 2023, under the European Funds for a Modern Economy (FENG) program, PARP launched the "Startup Booster Poland – Smart UP" initiative, selecting 17 accelerators in Poland for a total funding of approximately PLN 260 million. Startups participating in these programs will be able to receive grants of up to PLN 400,000. Public financial support appears to be indispensable in the scaling process.[19]

Vaido Mikheim, Startup Estonia:
We adopted a funding scheme originally developed in Finland for the business development of deep tech startups. In Finland, it was known as the Tempo measure, but we have adapted it and now call it the "Deep Tech Business Development Measure," or simply "Ärgas." The implementation process took us just under a year from the moment we decided to proceed. While selling the idea to the ministry took a bit longer, the actual implementation was completed relatively quickly for the public sector. We are now actively distributing funds to startups under this measure.[7]

Jaana Rantanen, Business Finland:
Typically, the first step for a startup is to obtain funding through the Tempo program, which provides a €60,000 grant, with the total project value being €80,000. This funding is aimed at helping startups gather feedback from potential customers and explore market opportunities. Although Tempo is a grant, it covers only 70% of the costs, meaning startups need to secure their own funding for the remaining amount. Additionally, the company must have at least a two-person team. The idea behind this grant is to prepare the company for a more comprehensive R&D project afterward. If the results from the Tempo project are promising, the next step is often to apply for R&D funding from Business Finland, either as a grant or a loan, depending on the nature of the work.[22]

Sofija Martinsone, Investment and Development Agency of Latvia:
One of the main challenges is that our grants and other programs typically don't cover 100% of the funding. Companies need to contribute their own funds, whether it's 10% or 40%. This is often a struggle, but it's essential for them to find the money or partners who believe in their idea.[31]

Research to business funding

One of the 10 recommendations to develop Estonia's deep tech ecosystem, created as part of the Deeptech Sandbox project, emphasizes the need for consistent public funding for research teams during the proof-of-concept phase and the transition from science to business. Business Finland has been providing this type of support for over 10 years and, moreover, offers a clear development pathway and next steps programs.

Jaana Rantanen, Business Finland:
We have a type of funding called "Research to Business." This is research funding intended for universities and research organizations that want to commercialize their research results. They can apply for this funding to support pre-commercialization activities. Through this, they show us that they have a team and an idea of how to utilize their results, and what kind of product could emerge from it. The project should focus on finding the right way to commercialize the research. If the project results in a startup, the university decides whether to transfer the IP. At the end of the project, we discuss what is expected from the spinoff so it can receive next funding and services from Business Finland.[22]

Gabriela Konopka-Cupiał, Centre for Technology Transfer CITTRU:
The key initiatives were the funds for pre-implementation research, such as those from the "Innovation Incubator" project funded by the Ministry of Science, which enabled the creation of prototypes and the conduct of studies that facilitated later cooperation with businesses. Many projects that we commercialize benefited from this support. At Jagiellonian University, an additional source of funding was the allocation of 2% of the subsidy for commercialization purposes, which helped startups like IntoDNA.[5]

Sofija Martinsone, Investment and Development Agency of Latvia:
We had a commercialization program, which ended in December after running since 2017. This program provided grants to research organizations to advance ideas from a Technology Readiness Level (TRL) of around 3 or 4 to 6, 7, or 8. The goal was to help these organizations develop products they could sell, either to companies or by creating spin-offs. Despite challenges with current laws, which are not as favorable as in the US for spin-offs, more than 100 ideas were successfully developed and most of them sold, both in Latvia and abroad.[31]

Legal and tax incentives

Taking into account the challenges faced by startups and scaleups, particularly related to the talent shortage described in this report, the countries in the BSR-5 region offer additional support tools. In Latvia, the Startup Visa program has already benefited 66 companies (112 individuals).[29] Similar tools for non-EU founders are also offered by Lithuania and Estonia, while in Finland, the equivalent is the Finnish Startup Permit. Additionally, the Baltic countries provide some of the best regulations in Europe for companies that want to offer stock options to their employees.[35]

Lithuania has a favorable tax regime that includes corporate income tax exemptions for small businesses and specific deductions for companies investing in digital transformation and R&D.[21] The government also offers specific tax incentives for companies engaging in R&D, including a "patent box" initiative that grants a 5% tax rate on intellectual property profits.

Vaido Mikheim, Startup Estonia:
Our ecosystem has been fairly transparent, with minimal corruption, clear legislation, and everything accessible in English and digitally.[7]

Sofija Martinsone, Investment and Development Agency of Latvia:
Startup visa is offered to all non-EU startup founders. One startup can have up to 5 founders with a startup visa. The visa is given for the period of maximum 3 years and it is spouse and children-friendly. The main criteria for getting Startup visa is an innovative (most often technology-based) Startup idea, which is easily scalable and yields a high added value.[31]

Success stories

Some of the most spectacular success stories of startups and scaleups in the studied BSR-5 IE include the Polish-Finnish ICEYE, which specializes in producing satellites with SAR radars and received another funding round of $93 million in 2024, bringing the total capital raised by the company to $438 million.[36] Another example is ElevenLabs, focused on voice technology research, which achieved success in just 18 months, raising $80 million in a Series B round and earning the title of Poland's unicorn.[37] In Finland, key players include Oura Health, a health technology company that produces a smart ring used to track sleep and physical activity, raising $100 million in a Series C round and introducing their technology into fashion through collaboration with Gucci.[38] Another example is Bluefors, which offers industry-standard cooling solutions for quantum technology, fundamental physics research, and other low-temperature applications. This year, the company launched a next-generation gas handling system to help professionals in quantum technology manage cryogenic measurement systems.[39] A Lithuanian example is PVcase, a climatetech company and global leader in solar project design software, which secured a $100 million investment in 2023.[40] In Estonia, notable companies include Skeleton Technologies, one of the leaders in ultracapacitor production, collaborating with giants like Siemens and Škoda[41]. In 2023, the company closed a €108 million funding round.[42] Another significant actor is Starship Technologies, which produces small delivery robots. The total capital raised by Starship Technologies exceeds $100 million, and by 2021, the company had completed over one million deliveries.[43] From Latvia, Aerones stands out, having raised $38.9 million in Series A funding to develop robotics for wind turbine maintenance.[44]

Success in the world of deep tech startups and scaleups takes various forms, depending on the industry, stage of development, and the unique challenges each company encounters. It can manifest in many ways, from technological breakthroughs to securing crucial funding or partnerships. The following examples are recommended by the partners of the Finest Scaleup project as worth watching.

Widmo Spectral Technologies (Poland)

Widmo Spectral Technologies, a Polish technology company, has achieved significant success by securing €5.5 million in funding from the EIC Accelerator program. The company, a graduate of the Kraków Technology Park acceleration program, develops advanced spectroscopic technologies with potential applications in the medical and industrial sectors. The funding from the EIC Accelerator has enabled the company to accelerate its commercialization efforts and expand into international markets.[45]

Naco Technologies (Latvia)

Naco Technologies from Latvia is an example of success in the green technology sector. The company recently secured €10 million to continue its research and development work on green hydrogen production technologies. Green hydrogen is crucial for the future of global energy transformation. The investment in Naco Technologies demonstrates that Lithuanian startups can attract significant investments and play an important role in combating the climate crisis.[46]

Litilit (Lithuania)

Litilit, a Lithuanian company specializing in femtosecond laser technology, has secured a significant investment from Taiwania Capital, a prominent venture capital firm from Taiwan. This partnership marks a major milestone for Litilit, as it aims to expand its production capabilities and increase its global reach in the rapidly growing femtosecond laser market. Femtosecond lasers are cutting-edge tools used in a variety of industries, including medical technology, scientific research, and advanced manufacturing. Litilit has established itself as a leader in this field by developing highly efficient and compact laser systems.[47]

LightCode Photonics (Estonia)

LightCode Photonics is a deep tech company on the cutting edge of mobility technology, reimagining how machines perceive their surroundings. The company's innovation lies in transforming traditional 3D imaging, moving away from human-like perception toward a more advanced form of robotic vision. Their flagship product, the world's first Software-Defined 3D Camera (SD3D Camera), represents a breakthrough in 3D imaging technology. LightCode Photonics, a spin-off from the University of Tartu, was founded in 2020 by a team of four physicists with a vision to revolutionize robotic vision. The company's innovative approach has already gained significant recognition, including a €200,000 investment led by the Estonian Business Angels Network (EstBAN) after their win at the sTARTUp Pitching 2022 competition.[48]

Onego Bio (Finland)

Onego Bio is a Finnish biotech company specializing in animal-free egg protein production, has secured $15.2 million in funding to further develop and scale its groundbreaking technology. The investment round was led by Agronomics and Maki VC, positioning Onego Bio as a leader in sustainable food solutions. Onego Bio produces Bioalbumen, a precision-fermented egg white protein that is molecularly identical to traditional egg whites but created without the use of animals. This innovative approach reduces the environmental footprint of egg production by using significantly fewer resources, such as water and land, and eliminates the ethical concerns associated with animal farming.[49]

Summary

Despite many challenges, the Baltic region is the fastest-growing area for the Deep Tech sector, increasing 3.6 times between 2019 and 2024. The Nordic countries, including Finland, saw a growth of 2.9x, while the average for the EU and CEE is 2.7x.[2]

The 2024 European Deep Tech Compensation Benchmark report identifies key challenges for deep tech companies in Europe, including attracting and retaining talent due to competition with larger tech firms offering higher salaries, long development cycles causing financial strain, difficulties in securing long-term funding, and challenges in building management teams with both scientific and technical expertise. All of these challenges also affect the BSR-5 region and have been outlined in this report after discussions with founders of startups and scaleups in the region.
The best practices cited in this report from leading deep tech ecosystems in Europe, such as the Cambridge region (UK), the Eindhoven region (Netherlands), and the ecosystem surrounding the Technical University of Denmark, as outlined in the 10 recommendations for developing Estonia's deep tech ecosystem in the BSR-5 region, are gradually being implemented. Of course, to varying degrees in different places, cities and countries. The ones described in the report are: involvement of investors in the early phases of company development, creating opportunities for researchers and entrepreneurs to connect and public funding for research teams during the proof-of-concept phase.

This report describes many best practices, as well as proposed changes that could accelerate the growth of the deep tech sector, such as early involvement of funds and companies in defining research questions to better align university research with market needs, potentially bridging the gap between academic assumptions and industry demands. Companies could also provide essential infrastructure for deep tech startups to build and test prototypes.[4,5] Legislative changes are also necessary to address various issues faced by deep tech companies. For instance, Estonia is working on simplifying processes to create a "fast track" for bringing in employees.[7] In Latvia, regulatory changes are needed, including clarifying the rules on risk management for public funds and supporting innovation through public institutions.[4] However, it is important to remember that sometimes smaller-scale solutions—quick wins—can also be helpful, such as providing contract templates and basic documents for early-stage founders, as is being done in Estonia.[7]

Diversity remains crucial for deep tech development, yet there is a lack of detailed data on female founders in the sector. Success stories like Olga Malinkiewicz of Saule Technologies, who won two European Inventor Awards in 2024 for her work on perovskite-based solar cells[50], and Maja Itkonen from Onego.bio, a designer and serial entrepreneur advocating for alternative proteins, showcase the contributions of women in deep tech. A 2023 study by the Aper Ventures fund on women in deep tech in the Visegrad countries shows that women lead 1 in 4 Polish deep tech startups. Initial research in the BSR-5 region found that out of 293 companies with Dealroom data, 82 (28%) had at least one female founder. However, this data is incomplete, and further research is planned.

In this project, we will continuously update the database of startups, scaleups, and investment funds, including funds from outside the BSR-5 region that are interested in investing there. We will also delve deeper into the challenges faced by deep tech startups and scaleups to tailor the project's offerings accordingly. Additionally, we will expand research on female deep tech founders and women in investment roles. In the next phases of the Finest Scaleup project, we will focus on facilitating connections between venture capital funds and startups. We encourage you to follow the project's upcoming initiatives and explore the full interviews with key players supporting deep tech development in the BSR-5 region, as well as the databases of deep tech startups, scaleups, and ecosystem stakeholders.
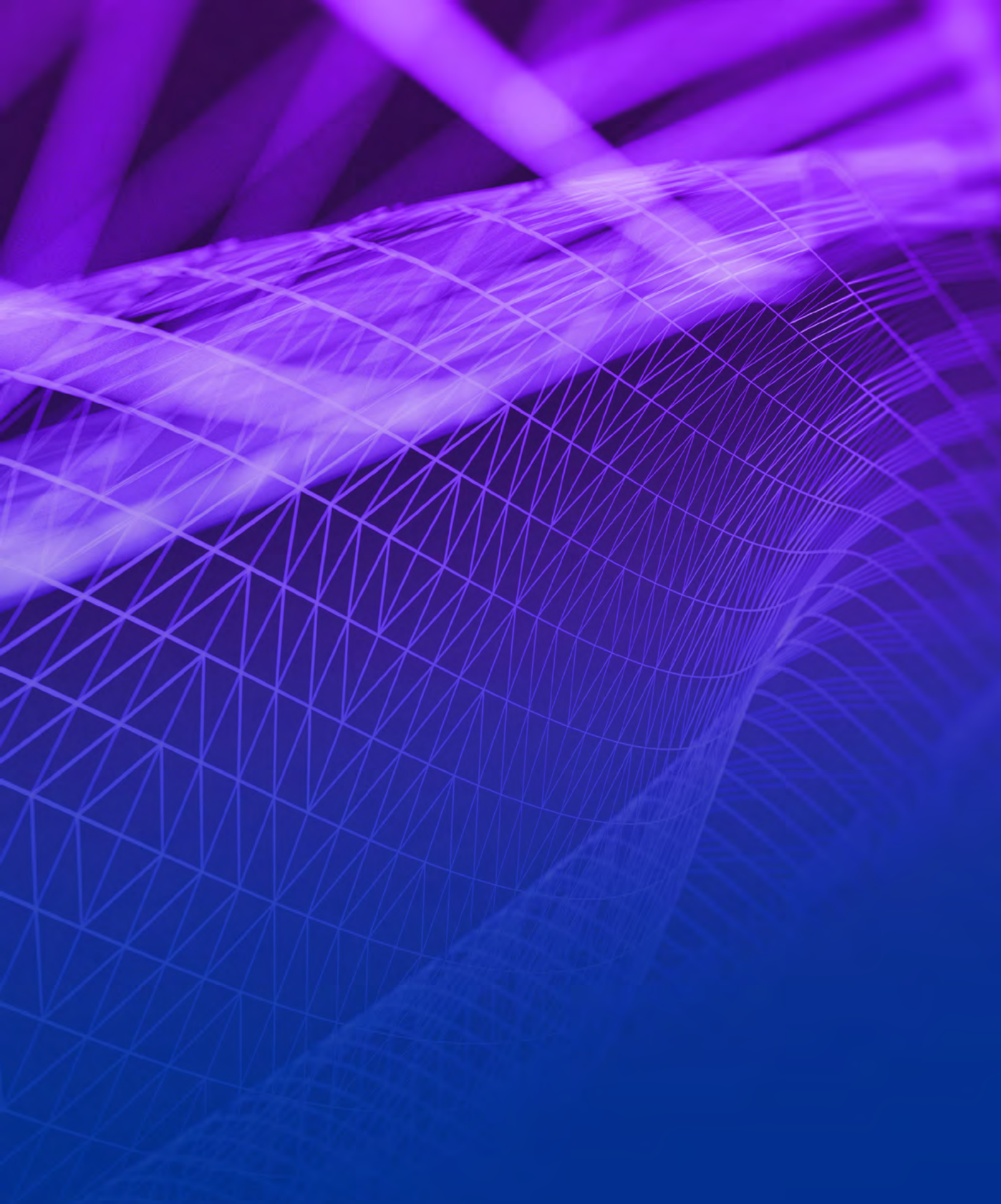
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