

DG REFORM

Integrated policymaking in the area of RDI

Call for tenders under REFORM/2021/OP/0006 Lot 1

RFS ID: TSIC-RoC-19598

4 December 2024 – Extensive Report on the Ecosystem of Automation and Robotisation in Slovakia

Technical Support Instrument

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The project is funded by the European Union via the Technical Support Instrument, managed by the European Commission Directorate-General for Structural Reform Support.

This report has been delivered in **November 2024**, under the EC Contract No. **TSIC-RoC-19598**. It has been delivered as part of the project "**Integrated policymaking in the area of RDI**".



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1. Introduction

1.1. Overall purpose of the report

This report, prepared under DG REFORM's call for tender REFORM/2021/OP/0006 Lot 1 "Integrated Policymaking in the Area of RDI," specifically under Deliverable 3, provides an extensive overview of the Industrial automation and robotisation ecosystem in Slovakia.

Drawing on a dataset of nearly 2,463 Slovak companies selected using automation and robotisation keywords, this report offers insights into their industrial affiliations, activities, size, and age. It examines three main groups: 1) industrial automation companies, 2) manufacturing companies engaged in R&D, and 3) software development companies involved in R&D. This analysis assesses the current state and future potential of industrial automation in Slovakia and identifies some of the critical high-value-added companies.

In addition to focusing on Slovakia, the report provides an overview of the Visegrád region. It analyses the automation and robotisation ecosystems of all Visegrád countries, categorising them into three clusters to offer a comprehensive regional perspective and contextualise Slovakia's performance. The regional overview aims to provide context rather than precise rankings or definitive market positioning. Given the variations in the economic sizes of the countries and the level of technology specificity, this comparative framework seeks to offer insights and enhance understanding of Slovakia's performance. However, given the limitations of full coverage, the results should be interpreted with caution.

This report complements earlier reports by offering a broader analysis of Slovak companies, not just those at the cutting edge of technology. It includes an introduction, methodological overview, key findings summary, and analyses of Slovak and Visegrád automation and robotisation companies overall and by three focus groups.

1.2. Methodology overview

This analysis draws on data from Orbis, Dealroom, LinkedIn, and Technote databases, covering a comprehensive range of Slovak and Visegrád companies.

Over 58,000 companies were analysed from the Orbis database for Slovakia, including all large, very large, and medium-sized firms and those in selected industries such as machinery and automotive. LinkedIn data provided information on 42,000 Slovak companies, while the Dealroom database included data for 1,519 Slovak firms.

We used the Milda.ai platform to pinpoint companies active in automation and robotisation technologies. Milda employs AI-driven methods to identify relevant firms within niche technologies. Researchers utilised keywords related to automation, robotics, artificial intelligence, and sensor technology to locate companies engaged in these fields. Milda's AI identifies companies by using these keywords in descriptions of their activities, technologies, or products.

After scanning the data from Orbis, Dealroom, and LinkedIn, the team identified nearly 2,463 companies in Slovakia involved in automation and robotisation.

The figure below presents the results from the Milda search (Figure 1). To access the complete list of companies in the Visegrád region, please use the following links:

Slovakia: https://milda.ai/search/keyword_search?id=6687e98cce024bce24d4df33

Poland: https://milda.ai/search/keyword_search?id=6687eb0fce024bce24d4dfbe

Czechia: https://milda.ai/search/keyword_search?id=6687ebc3ce024bce24d4e00a

Hungary: https://milda.ai/search/keyword_search?id=6687ec6ace024bce24d4e036

In addition to the core company metadata such as industry, age, and size, Milda.ai provided four types of additional data:

- **Products and services:** information gathered from company websites.
- **Key events:** details on significant company events, such as partnerships, investments, new contracts, and intellectual property activities.
- **Patent data:** information from the PATSTAT database.
- **Value chain positioning:** classification of companies across 14 activities: Consulting and project Management; R&D; Critical Raw Materials; design and engineering; distribution and sales; logistics, Transport and Storage; Machinery Hardware and components; maintenance and repair; manufacturing and assembly; mining and extraction; operators and providers of Management Services; raw and processed Materials; recycling and waste Management; and Software and IT Solutions.

This report uses industry and value chain data to analyse the Slovak and Visegrád automation and robotisation ecosystem, organising companies into three main clusters:

- **Cluster 1:** includes companies involved in industrial automation, specifically those engaged in manufacturing and adding/developing software/IT components, as well as computer/IT services firms developing industry-specific software and applications (see Subsection 4.1.1.).
- **Cluster 2:** comprises companies focused on manufacturing and R&D activities (see Subsection 4.1.2.).
- **Cluster 3:** encompasses companies involved in software development and R&D (see Subsection 4.1.3.).

In the analysis, 314 out of the nearly 2,463 companies were identified as being engaged in some form of R&D activities. To determine R&D involvement, companies were assessed based on the following three criteria:

1. **Patent applications:** companies were considered involved in R&D if they applied for patents, which indicates active innovation and technological development.
2. **Affiliation with R&D industry:** companies were flagged as R&D if their main industry was indicated as R&D.
3. **R&D keywords:** companies were included in the R&D category if their activities or services were explicitly mentioned in their listed keywords related to research and development.

Commentary on coverage and data accuracy

Coverage: our analysis includes over 95% of Slovak companies engaged in robotisation and automation technologies. This high coverage is based on two key factors:

- **Source reliability:** we used comprehensive data from company registers (Orbis) and LinkedIn, the latter of which is current through 2023.
- **Manual verification:** the sample was cross-checked with key industry players identified during the desk research and literature review and/or recommended by the Steering Group.

Data accuracy: preliminary checks suggest that Milda accurately classifies approximately 90% of companies. Some minor inaccuracies occur when companies use vague language to describe their activities. For instance, general statements about products or services may not clearly indicate specific value chain positions like manufacturing or assembly.

Source credibility: Milda's algorithms address concerns about data accuracy from company websites. They filter out promotional language and focus on factual information, ensuring that the data accurately reflects company activities without being influenced by exaggerated claims. Company websites are still valuable for detailing company positions and events within the value chain.

FIGURE 1. LIST OF SLOVAK COMPANIES INVOLVED IN AUTOMATION AND ROBOTISATION TECHNOLOGIES (SNAPSHOT TAKEN FROM AN ACTUAL SEARCH PERFORMED ON MILDA.AI)

automation OR artificial intelligence OR robot OR robotic OR robotization OR robotisation OR automatic OR automatically OR automate OR automates OR automated OR automating OR robotic OR robotics OR automatic OR AI OR AI solution or AI tool or AI system or AI platform OR deep learning OR predictive OR iot OR internet of things OR digitization OR digitisation OR digitized OR digitised OR digitalized OR digitalizing OR digitalised OR digitalisi digital transformation OR advanced sensor OR sensor technology OR automotive sensor

Smart Search ?

All companies **2619** All events **2506** Overview Top companies Top events last year

← PREVIOUS 1-100 of 2619 NEXT → [SHARE RESULT](#)

#	COMPANY	RELEVANCE	MILDA SCORE	PATENTS	COUNTRY	INDUSTRY
6	ABCOM	100%	Top-50%	0	SK	Electronics and Machi...
7	RMC	100%	Not ranked	0	SK	Electronics and Machi...
8	HITHORIZONS	100%	Top-25%	0	SK	Energy
9	SCANSTUDIO	100%	Top-50%	0	SK	Construction and Arch...
10	NATEK	100%	Top-50%	0	SK	Computer/IT Services
11	SOLARGIS	100%	Top-25%	0	SK	Energy
12	NOVIS	100%	Top-10%	1	SK	Financial Services
13	KFB	100%	Top-50%	0	SK	Energy
14	DYSON	100%	Top-50%	0	SK	Other Professional Ser...
15	MICROSTEP	100%	Top-25%	2	SK	Mining and Metals
16	SPINEA	100%	Top-25%	1	SK	Electronics and Machi...
17	ACCACE	100%	Top-25%	0	SK	Legal Activities
18	AQUALIVE	100%	Top-50%	0	SK	Renewables and Envir...

2. Summary of key findings

Overview of Slovak companies in the Automation and Robotisation ecosystem

It is crucial to address barriers for SMEs and support high-growth sectors to enhance Slovakia's automation and robotisation ecosystem. The Biotech and Pharma industries, with their strong focus on R&D and the Security sector due to their extensive industry connections, offer promising opportunities for strategic investment.

The Slovak automation and robotisation ecosystem analysis evaluated **2,463 companies** across various industries (find analysis and data visuals in Chapter 3). The ecosystem mainly comprises Computer/IT Services, with 444 companies; Automotive, with 315; and Electronics and Machinery, with **297**. Significant representation is also found in Construction and Architecture (229), Consumer Goods/Retail (185), and Energy (104). Despite this diversity, the top three sectors account for 43% of the companies.

The market, characterised by firms with over a decade of operation and a substantial SME presence (54% small and 32% medium-sized companies), illustrates a **mature and stable environment**. However, **new ventures face significant barriers**, including limited access to risk finance, high startup costs, and scaling difficulties. Enhancing support for SMEs, improving financial access, and streamlining regulatory processes to promote a more dynamic market is crucial. These measures will stimulate innovation and growth, fostering a more competitive and responsive ecosystem.

The Slovak market is characterised by a robust industrial base that emphasises manufacturing, assembly, and distribution. This is reflected in the significant number of companies engaged in such operational activities as 823 in **manufacturing and assembly**, 721 in **distribution and sales**, and 687 in **machinery, hardware, and components**. While this industrial dominance highlights Slovakia's economic strength, it also exposes certain vulnerabilities, including susceptibility to economic cycles, supply chain dependencies, and challenges related to technological advancements, labour market dynamics, regulatory compliance, and global competitive pressures.

To address these vulnerabilities and enhance growth prospects, Slovakia should diversify its industrial activities and invest in technology and innovation. Many companies are already engaged in **software/IT** (595) and **R&D** activities (314), indicating a shift towards technological advancement. Notably, **67% of Biotech and Pharmaceutical companies focus on R&D**, underscoring their significant growth potential. This emphasis on innovation highlights the potential and commitment to development and presents attractive investment opportunities, providing a pathway to diversify and strengthen Slovakia's economic landscape.

The network analysis reveals that **Consumer Goods/Retail** is the most central industry, driving early technology adoption and fostering cross-sector collaboration. This is pushed by the need to meet consumer expectations, maintain competitiveness, optimise operations, and respond to market trends. **Electronics and Machinery** with the highest eigenvector centrality¹, plays a crucial role in **technological advancements** and **industrial innovation**. **Computer/IT Services**, with their high closeness centrality, are key for **digital transformation** and **industry integration**.

Additionally, Slovakia's **Security (incl. defence)** sector presents a unique opportunity for strategic development due to its high betweenness and closeness centrality within the industrial network. These characteristics underscore its critical role in linking and influencing various sectors, particularly

¹ A measure of influence in the network.

Computer/IT Services and Mining and Metals. This sector is exceptionally well-positioned to drive cross-sectoral integration and innovation. Slovakia's existing strengths in **Electronics, IT Services, and Manufacturing** align seamlessly with the needs of the Security sector, particularly in cybersecurity, surveillance, and advanced defence technologies. Investing in the Security sector can strengthen national defence and drive broader industrial growth and technological advancement.

Overview of Visegrád countries in Automation and Robotisation

Increasing investment in R&D and supporting SMEs is crucial to improving Slovakia's innovation performance in the EU. Enhancing these areas will drive innovation, sharpen Slovakia's competitive edge, and create a more dynamic and resilient industry.

The analysis identified 7,805 companies in Poland, 4,119 in Czechia, 2,463 in Slovakia, and 1,871 in Hungary, with a significant concentration in the **Computer/IT Services, Automotive, and Electronics/Machinery sectors**. These industries are key to the region's economy, supported by a favourable geographic location, historical industrial foundations, and policies encouraging foreign investment. The presence of EU membership, well-established infrastructure, and government incentives also play a role in shaping the economic landscape, making the region an important player in manufacturing and technology.

Regarding operational activities, Poland, Czechia, Slovakia, and Hungary exhibit commonalities, particularly in **Manufacturing and Assembly, Distribution and Sales, and Machinery, Hardware, and Components**. Differences in research and development (R&D) activities, however, are evident. **Slovakia's R&D involvement (13%) is notably lower** than Czechia (24%), Hungary (21%), and Poland (18%), suggesting areas for growth. **Czechia stands out in R&D**, particularly within the high-tech and automotive sectors, aided by foreign investment and cooperation between academia and industry. Hungary has made progress in innovation, benefiting from targeted government support and sector collaboration. Poland's substantial R&D investments, including those from the EU Chips Act, have strengthened its semiconductor sector. While Slovakia maintains a strong industrial base, especially in automotive manufacturing, its R&D efforts trail its neighbours. **Increasing R&D investment is crucial for enhancing Slovakia's innovation capacity and competitiveness.**

The Visegrád's market is mature, with 85% of Slovak companies over ten years old, 80% in Poland, 87% in Czechia, and 84% in Hungary. This may pose entry barriers **for new firms**, as evidenced by the minimal presence of younger companies and startups (1-5 years). Regarding company size, **Slovakia has a higher proportion of smaller companies**, with 36% having fewer than ten employees. In contrast, **Poland and Czechia feature a more significant percentage of medium-sized companies** (10-249 employees) – 44% in Poland and 47% in Czechia. This indicates that **Poland and Czechia have a more economically diverse sector** with a significant industrial and economic scale. In contrast, Slovakia and Hungary have a landscape dominated by SMEs.

The turnover distribution further highlights Slovakia's concentration of small to mid-sized companies, with a significant 68% of Slovak firms having a turnover of less than EUR 5 million. The Slovak economy is diversified but heavily relies on sectors where small companies can thrive, such as automotive, electronics, machinery, and services. The supply chains in these industries often require specialised small suppliers and service providers. This suggests a **need for enhanced support and funding to facilitate the growth** of mid-sized firms and improve their market presence.

3. Analysis of the Slovak Industrial automation and robotisation ecosystem

3.1. Overview of Slovak companies within the Automation and Robotisation ecosystem

We analysed a total of **2,463 companies** with established connections to **automation** and **robotisation**. They span diverse industries, with the most prevalent sector being **Computer/IT Services**, with **444 companies** (Table 1). **Automotives**, at **315**, and **Electronics and Machinery**, at **297**, take second and third place by count. Additionally, sectors like **Construction and Architecture**, **Consumer Goods/Retail**, and **Energy** have substantial numbers of companies, with **229**, **185**, and **104**, respectively. Despite the diverse industries represented, the companies are mainly concentrated in the top industries, with the **top 3 sectors constituting 43%**.

TABLE 1. COUNT AND SHARE OF COMPANIES BY INDUSTRY IN SLOVAKIA

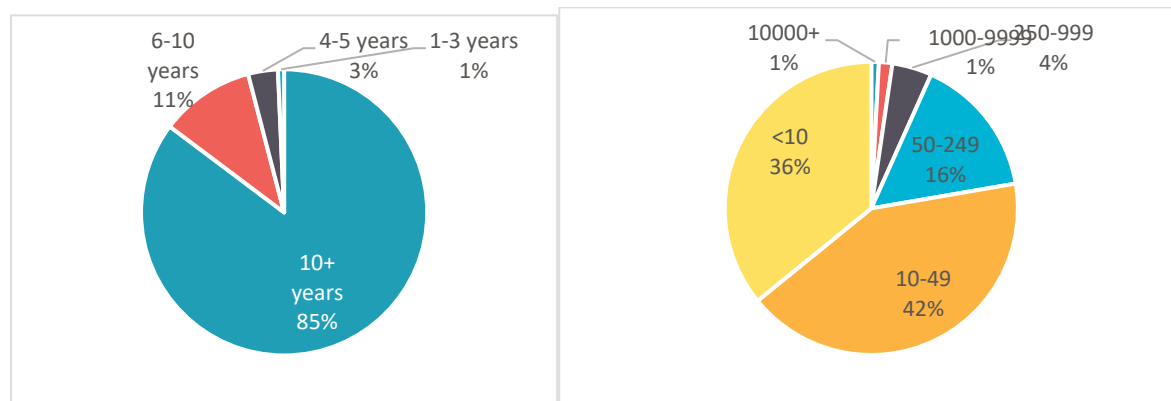
INDUSTRY	COUNT	SHARE
Computer/IT Services	444	18%
Automotives	315	13%
Electronics and Machinery	297	12%
Construction and Architecture	229	9%
Consumer Goods/Retail	185	8%
Energy	104	4%
Health and Wellness	81	3%
Mining and Metals	74	3%
Advertising and Market Research	70	3%
Food and Beverages	69	3%
Logistics, Transportation and Warehousing	62	3%
Telecommunications	51	2%
Agriculture and Fisheries	48	2%
Renewables and Environment	45	2%
Biotech and Pharma	43	2%
Medical Devices	38	2%
Security	37	2%
Apparel and Textiles	36	1%
Graphic/Visual Design	32	1%
Chemicals	26	1%
Other	177	7%
Total	2,463	100%

Source: produced by the study team.

Older companies are most prevalent among the analysed companies, with **85% being over ten years old** and **12% between 6 and 10 years old** (Figure 2). These numbers reflect a mature environment with established players and **limited representation of companies in the 4-5 year and 1-3 year** age brackets (entry- and growth-stage startups). This indicates potential barriers to entry for newer, innovative, and entrepreneurial ventures, such as limited access to risk finance, high initial investment costs, **or the dominance of established players**.

Regarding size, the ecosystem is dominated by **small and medium-sized enterprises**, which account for **54%** and **32%** of companies, respectively, followed by **16%** of large enterprises (Figure 3). The Slovak economy is diverse but significantly depends on sectors where small businesses excel, such as automotive, electronics, machinery, and services. These industries often require specialised small suppliers and service providers to support their supply chains.

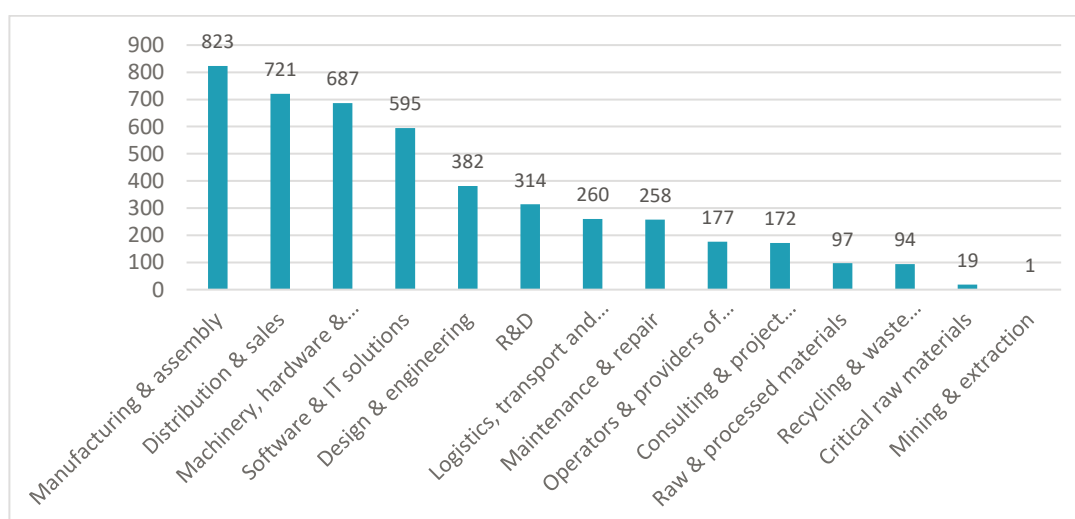
FIGURE 2. & FIGURE 3 . ANALYSED COMPANIES BY AGE (N=1,807) AND HEADCOUNT (N=886)



Source: produced by the study team.

In addition to analysing industrial affiliations, we also examined company activities—specific tasks and functions contributing to higher value (Figure 4). The overview by count shows that most companies are engaged in **manufacturing and assembly**, with 823 companies involved. It is followed by 721 companies in **distribution and sales** and 687 in **machinery, hardware, and components**. **Software and IT solutions** engage 595 companies, while 314 are actively involved in **R&D**, significantly driving innovation and technological advancement.

FIGURE 4. ANALYSED COMPANIES BY ACTIVITY

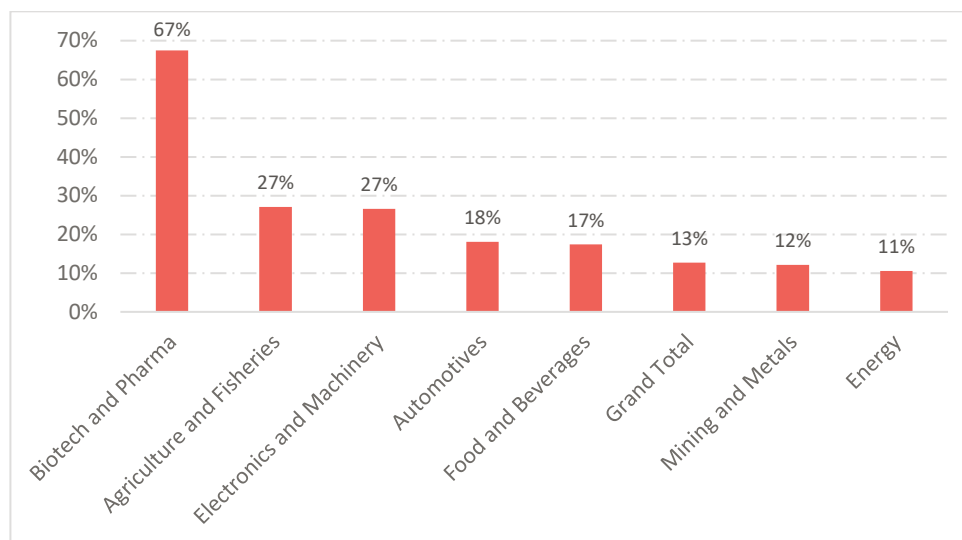


Source: produced by the study team.

It is worth noting that companies affiliated with the **Biotech and Pharma** industries are by far the most involved in **R&D** at 67%, compared to the overall 13% for all industries combined (Figure 5). This high level of involvement highlights the sector’s emphasis on rapid innovation, drug development, and

advancements in medical technologies. This strong focus not only drives current breakthroughs but also positions the industry for significant growth and expansion in the future.

FIGURE 5. TOP INDUSTRIES BY SHARE OF COMPANIES ENGAGED IN R&D ACTIVITIES



Source: produced by the study team.

A more in-depth examination of operational activities within industries reveals distinct focus areas (Table 2):

- The **Computer/IT services** industry is highly focused on **software and IT solutions** (96%), reflecting its core expertise, as expected. Additionally, these firms engage in **consulting and project management** (18%), which supports technological adoption and digital transformation across other industries.
- **Automotive** companies are heavily involved in **distribution and sales** (48%), focusing on market delivery, manufacturing and assembly (37%), indicating the need for extensive production capabilities and **maintenance and repair** (27%), addressing ongoing vehicle service needs.
- **Electronics and Machinery** firms naturally concentrate on **manufacturing and assembly** (65%) and **machinery, hardware & components** (48%). Additionally, these companies are significantly engaged in **design engineering** (31%), reflecting the need for continuous innovation and development in tech products to keep pace with technological advancements.

TABLE 2. SHARE OF COMPANIES PER ACTIVITIES WITHIN EACH INDUSTRY

Industry	Manufacturing & assembly	Distribution & sales	Machinery, hardware & components	Software & IT solutions	Design & engineering	R&D	Logistics, transport and storage	Maintenance & repair	Consulting & project management	Operators & providers of management services	Recycling & waste management	Raw & processed material	Critical raw materials
Computer/IT Services	5%	14%	12%	96%	8%	2%	7%	5%	18%	10%	1%	0%	0%
Automotives	37%	47%	30%	7%	12%	18%	14%	27%	3%	4%	4%	7%	2%
Electronics and Machinery	65%	29%	48%	11%	31%	27%	7%	13%	4%	4%	3%	5%	0%
Construction and Architecture	42%	25%	28%	3%	24%	3%	10%	14%	8%	4%	4%	0%	0%
Consumer Goods/Retail	24%	67%	31%	4%	9%	3%	7%	7%	3%	5%	5%	0%	0%
Energy	25%	26%	22%	12%	29%	11%	11%	17%	5%	18%	6%	0%	0%
Health and Wellness	6%	20%	22%	5%	1%	1%	1%	7%	7%	2%	0%	0%	0%
Mining and Metals	50%	9%	47%	3%	32%	12%	9%	7%	3%	7%	4%	16%	8%
Advertising and Market Research	4%	13%	9%	10%	7%	3%	1%	0%	4%	3%	1%	0%	0%
Food and Beverages	75%	48%	45%	3%	13%	17%	7%	7%	4%	3%	4%	0%	0%
Logistics, Transportation and Warehousing	15%	15%	23%	13%	6%	0%	98%	11%	2%	29%	2%	0%	0%
Telecommunications	18%	20%	18%	27%	8%	2%	2%	2%	0%	20%	0%	0%	0%
Agriculture and Fisheries	63%	52%	56%	8%	17%	27%	23%	10%	2%	6%	4%	10%	2%
Renewables and Environment	7%	7%	13%	9%	7%	2%	13%	4%	13%	7%	36%	0%	0%
Biotech and Pharma	47%	21%	12%	16%	5%	67%	2%	2%	7%	0%	2%	23%	2%
Grand Total	33%	29%	28%	24%	16%	13%	11%	10%	7%	7%	4%	4%	1%

Source: produced by the study team.

3.1.1. Findings from Network Analysis of the Slovak Automation and Robotisation Ecosystem

Additionally, we conducted the network analysis (NA)² of the Slovak automation and robotisation ecosystem, focusing on companies with multiple industrial affiliations to identify possible industrial intersections and synergies pointing to high-value-added activities (Figure 6). NA allowed us to establish **which industries are central and which act as intermediaries**. **Central industries** are crucial within the network, driving innovation and influencing other sectors through high-value activities. **Intermediary industries** connect central industries, aiding collaboration and knowledge transfer. Mapping industrial interconnections and defining each industry's role in the network reveals insights into sector interactions and highlights opportunities for strategic partnerships and growth.

Central industries:

1. **Consumer goods/retail** shows the highest degree of centrality, a simple measure of centrality in the network. The industry is positioned at the core of the ecosystem and highlights its extensive connections across industries. This central role enables it to drive early adoption of technologies like e-commerce, digital marketing, and data analytics, enhancing supply chains, market expansion, and cross-sector collaboration. It is pivotal in shaping and integrating the ecosystem.
2. **Electronics and machinery**: with the highest eigenvector centrality and a measure of influence in the network, Electronics and Machinery is the most crucial industry to the ecosystem, driving technological advancements and industrial innovation. Its strong engagement in R&D, with 27% of companies involved (Table 2), further emphasising its role in fostering technological progress and enhancing industrial capabilities across various sectors.
3. **Computer/IT Services**: ranking high in closeness centrality, the Computer/IT Services industry stands out for its ability to interact with and influence other parts of the network swiftly. This role underscores its importance in digital transformation, providing essential software solutions and digital infrastructure across industries. Its widespread connectivity suggests a fundamental role in supporting and integrating technological advancements within the ecosystem.

Intermediary industries:

1. **Mining and metals**: this sector demonstrates high betweenness centrality, signifying its pivotal role as a bridge connecting various parts of the network. Mining and Metals are crucial for supplying essential raw materials to other industries, especially Electronics and Machinery. This positioning highlights its significance in managing resource flows and supporting economic stability. Notably, the Mining and Metals industry also shows the highest closeness centrality and the 3rd highest degree of centrality, indicating its extensive network connections and ability to interact with other sectors quickly.
2. **Real estate**: Real estate's high betweenness centrality underscores its role in connecting various sectors and facilitating resource integration. Its high closeness centrality enhances its ability to engage with other industries. The NA suggests that Real estate supports the infrastructure necessary for automated systems and robotics, which are crucial for modernising industrial processes.

² By examining industrial interconnections through network analysis, we uncover how industries communicate and collaborate within the automation and robotisation ecosystem. The communication pathways in the network represent how information, resources, and influence flow between industries. Industries with higher centrality measures—such as degree, closeness, betweenness, and eigenvector centrality—play crucial roles in connecting sectors and shaping the network (for more details, see the Handbook).

3. **Security (incl. Defence):** The Security sector has the second highest betweenness centrality and a high closeness centrality, highlighting its pivotal role in connecting various industries and its significant influence over other sectors within the network, particularly in Computer/IT Services and Mining and Metals. This dual prominence indicates that the Security sector is exceptionally well-positioned to facilitate and benefit from cross-sectoral integration and innovation.

Industries with growth potential: Biotech and Pharma, along with Renewables and Environment, represent key growth areas with significant opportunities for future development. Their strong connectivity within the industry network highlights their potential for driving and benefiting from innovation and collaboration. Focusing on these sectors could enhance Slovakia’s sustainable growth and technological advancement.

Finally, the interplay between **Electronics and Machinery, Construction and Architecture,** and **Consumer Goods/Retail** creates a strong basis for advancing automation and robotics. Innovations in manufacturing, smart building technologies, and streamlined production enhance efficiency and customer experiences across sectors.

FIGURE 6. NETWORK ANALYSIS: INDUSTRY INTERCONNECTION MAPPING



Source: produced by the study team.

TABLE 3. NETWORK ANALYSIS: CENTRALITY MEASURES*

Industry	Degree	Betweenness	Closeness	Eigenvector
Consumer Goods/Retail	43	0.07	0.398	0.779
Electronics and Machinery	36	0.08	0.516	1.000
Mining and Metals	28	0.16	0.550	0.179
Construction and Architecture	26	0.06	0.434	0.597
Computer/IT Services	24	0.01	0.393	0.588
Food and Beverages	22	0.04	0.471	0.245
Logistics, Transportation and Warehousing	22	0.03	0.452	0.211
Automotives	20	0.12	0.493	0.319
Real Estate	20	0.12	0.532	0.078
Renewables and Environment	19	0.04	0.500	0.109
Energy	18	0.03	0.452	0.380
Packaging and Delivery	18	0.02	0.465	0.105
Security	18	0.12	0.508	0.074
Chemicals	17	0.05	0.493	0.057
Forestry and Wood	16	0.02	0.478	0.081
Health and Wellness	16	0.03	0.500	0.129
Advertising and Market Research	15	0.00	0.402	0.224
Medical Devices	15	0.07	0.500	0.176
Biotech and Pharma	13	0.01	0.440	0.106
Rubber and Plastic	13	0.08	0.471	0.081
Agriculture and Fisheries	12	0.00	0.407	0.207

Source: produced by the study team.

* The table presents industries with a degree centrality greater than 10.

** Industries with the 1st, 2nd, and 3rd highest measures in each centrality category are colour-coded as follows: **Dark green** for the 1st highest measure, **Green** for the 2nd highest measure, and **Light green** for the 3rd highest measure.

3.2. Prominent examples of Slovak Industrial automation and robotisation companies

Below, we provide some prominent examples of Slovak companies in the automation and robotisation industry. These companies specialise in highly technical and innovative fields, each focusing on advanced research, development, and production within their respective industries. They all collaborate with academic institutions or international partners to advance their technologies.



MULTIPLEXDX is a biotechnology company specialising in the development, production, and commercialisation of diagnostic tests for various human diseases, with a particular focus on cancer and infectious diseases like COVID-19 and Influenza. The company's innovative methods include the Multiplex9+ diagnostic method and the first RT-qPCR commercial test in the world to directly detect lineage B.1.1.7 (the British or UK variant). MultiplexDX collaborates with academic institutions, research agencies, and healthcare groups to advance its research and develop new RNA biomarkers.



ENVIROCARE is a company specialising in the research, development, testing, and production of biodegradable, compostable plastics. The company, established in 2004, collaborates with the Slovak University of Technology in Bratislava and the Slovak Academy of Sciences. ENVIROCARE primarily focuses on producing polylactic acid (PLA), polyhydroxyalkanoates (PHAs), and starch products with improved application properties. The company operates a pilot plant for testing polymer materials and produces its own biodegradable polymer materials. ENVIROCARE also cooperates with the university on education and organises workshops and courses in the field of polymer technology.



EVPU is a company specialising in the design, manufacture, and certification of various technical protection and mechanical barrier devices. The company is renowned for its high-precision power supply systems, which were developed for research laboratories, and its innovative multi-system static power semiconductor converters used for securing the transport of perishable goods. EVPU also collaborates with international partners, such as BAE Systems Hägglunds, in the defence industry.



DHM GROUP
INTEGRATED SOLUTIONS FOR METALLURGY

DHM GROUP is a leading machine building and engineering company with over 30 years of experience. Established in the field of metallurgy, DHM GROUP specialises in designing and manufacturing hydraulic machines for ferroalloy production, providing customers with cutting-edge solutions that combine proven approaches with new technological developments. The company offers a wide range of products, including taphole drilling machines, hydraulic equipment, and sintering machines for sintering plants, catering to various industries worldwide.



PLOSKON is a company specialising in the production of automation technology, with a focus on inductive sensors. The company offers a range of inductive sensors, divided into standard range and double range categories, and available at three different frequencies (slow, normal, and fast). Additionally, PLOSKON provides custom and specialised optical level sensors for applications like fluid management and process control, enhancing operational efficiency across various industries.

4. Overview of the Visegrád companies within the Automation and Robotisation ecosystem

4.1. Overview of the Visegrád companies within the Automation and Robotisation ecosystem

The following chapter offers an overview of Visegrád companies within the Automation and Robotisation ecosystem, providing valuable insights into regional positioning, sectoral strengths, and market dynamics.

The analysis identified a total of 7,805 Polish companies, followed by Czechia with 4,119, Slovakia with 2,463, and Hungary with 1,871 (Table 4). **The countries exhibit similar industrial landscapes, with most companies operating in the Computer/IT Services sector, followed by Automotives, and Electronics and Machinery in each country.** The numeric performance by companies is not surprising, as the countries differ in population size and economic scale. A notable observation is that Slovakia has a significant number of companies in the Consumer Goods/Retail sector, suggesting a stronger focus on the commercialisation of developed products.

TABLE 4. COUNT OF VISEGRÁD COMPANIES BY INDUSTRY

Industry	Slovakia	Poland	Czechia	Hungary
Automotives	315	470	377	129
Computer/IT Services	444	1,909	917	524
Electronics and Machinery	297	1,032	623	202
Construction and Architecture	229	843	347	141
Consumer Goods/Retail	185	210	99	53
Energy	104	311	173	53
Health and Wellness	81	181	85	74
Mining and Metals	74	316	187	57
Advertising and Market Research	70	276	93	58
Food and Beverages	69	169	75	36
Logistics, Transportation and Warehousing	62	234	129	59
Telecommunications	51	242	89	53
Agriculture and Fisheries	48	114	71	56
Renewables and Environment	45	148	98	37
Biotech and Pharma	43	158	107	70
Other	346	1,192	649	271
Grand Total	2,463	7,805	4,119	1,871

Source: produced by the study team.

Examining the operational activities of companies in the Visegrád region, the heatmap (Table 5) highlights each country's focus, with lower involvement shown in red and higher involvement in blue. Overall, the distribution of company activities is quite similar across the region. The countries show comparable engagement levels, with most companies involved in **Manufacturing and Assembly, Distribution and Sales, and Machinery, Hardware, and Components**. Hungary is the only exception, having the highest share of companies involved in Software & IT Solutions (37%). Additionally, **Czechia stands out as the leader in companies' R&D engagement** at 24%, followed by Hungary at

21% and Poland at 18%. **Slovakia has the lowest R&D involvement at 13%**, indicating a potential area for improvement to enhance its competitive edge in innovation and technology.

TABLE 5. SHARE OF VISEGRÁD COMPANIES INVOLVED IN DIVERSE ACTIVITIES

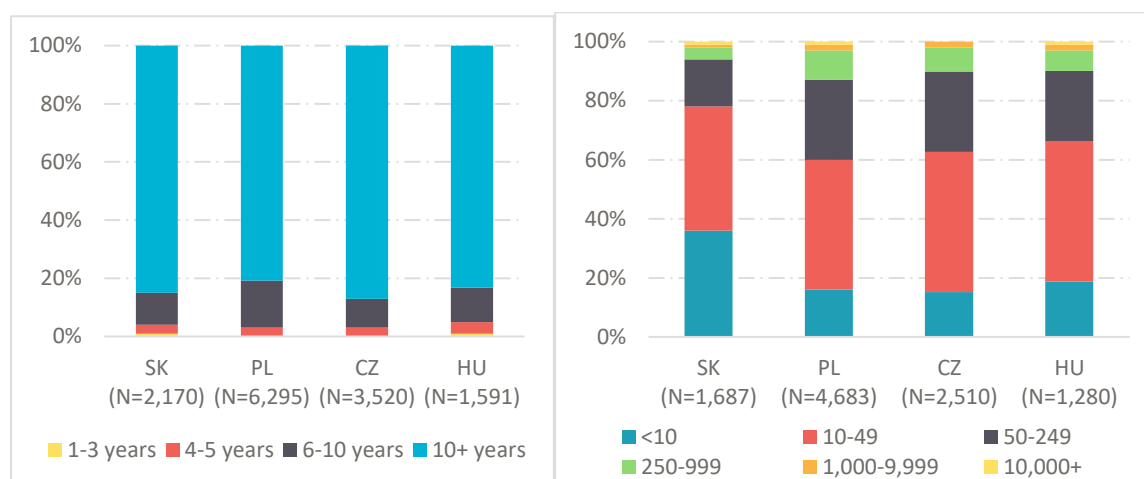
Activities	Slovakia	Poland	Czechia	Hungary
Manufacturing & assembly	33%	37%	40%	34%
Distribution & sales	29%	23%	22%	20%
Machinery, hardware & components	28%	29%	32%	26%
Software & IT solutions	24%	32%	30%	37%
Design & engineering	16%	19%	19%	18%
R&D	13%	18%	24%	21%
Logistics, transport and storage	11%	12%	14%	11%
Maintenance & repair	10%	8%	9%	7%
Operators & providers of management services	7%	8%	9%	9%
Consulting & project management	7%	8%	7%	10%
Raw & processed materials	4%	7%	6%	4%
Recycling & waste management	4%	4%	4%	4%
Critical raw materials	1%	1%	1%	1%
Mining & extraction	0%	1%	0%	0%

Source: produced by the study team.

In terms of age, **most companies across all Visegrád countries are well-established**, with 85% in Slovakia, 80% in Poland, 87% in Czechia, and 84% in Hungary being over 10 years old (Figure 7). Younger companies aged 1-5 years (entry- and growth-stage startups) represent a small fraction. Slovakia and Hungary each have 1% of companies aged 1-3 years, while Poland and Czechia have less than 1%, suggesting barriers to entry for new businesses.

Regarding company size, **Slovakia has a notably higher proportion of smaller companies**, with 36% **having fewer than ten employees** (Figure 8). This suggests a market heavily populated by **micro-enterprises** that may **struggle with scaling**. In contrast, Poland, Czechia, and Hungary have a larger percentage of medium-sized companies (10-249 employees), with 44% in Poland and 47% in Czechia. This indicates that these countries have more developed mid-sized sectors, which can offer better growth opportunities. Larger firms (more than 250 employees) are less common across all countries, with Slovakia and Hungary showing the lowest percentages. This indicates a potential **growth area for Slovakia**, where **increasing the number of large enterprises** could contribute to greater economic stability and job creation.

FIGURE 7. & FIGURE 8. SHARE OF VISEGRÁD COMPANIES BY AGE AND HEADCOUNT*

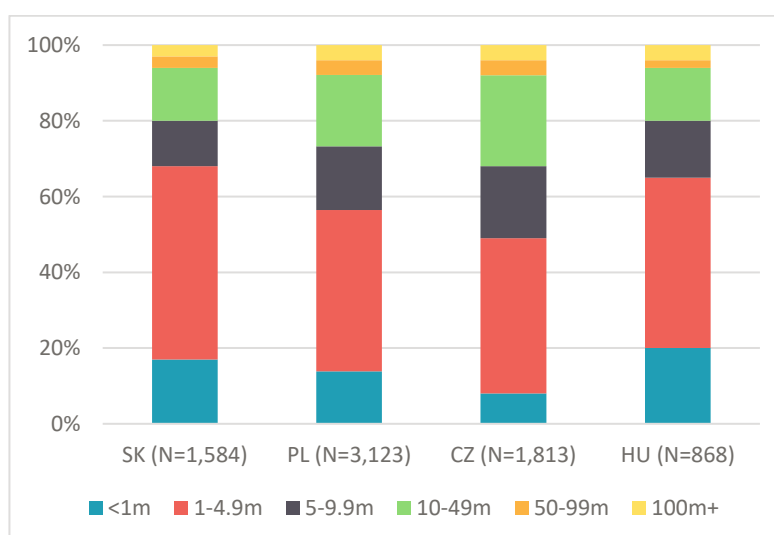


Source: produced by the study team.

* Considering data limitations, the total number of companies for each country and category is provided in the brackets.

The turnover distribution in the Visegrád region reveals that markets are predominantly characterised by SMEs, with most companies falling within the EUR 1-4.9 million turnover range and fewer reaching higher brackets (Figure 9). This indicates that these markets are still developing and have significant growth potential. Slovakia stands out with the highest proportion of small to mid-sized companies, as 68% of Slovak firms have a turnover of less than EUR 5 million. This significant concentration underscores an area for improvement where Slovakia could enhance its business environment by attracting more capital to support the expansion of mid-sized firms. To leverage its growth potential, Slovakia should focus on increasing targeted funding, offering specialised training, and improving market access for SMEs. By addressing these needs, Slovakia can better position itself for accelerated growth and market maturity.

FIGURE 9. SHARE OF VISEGRÁD COMPANIES BY TURNOVER (EUR)*



Source: produced by the study team.

* Considering data limitations, the total number of companies for each country and category is provided in the brackets.

4.1.1. Industrial Automation Companies

In this section, we examine Visegrád Group companies involved in industrial automation, including businesses dedicated to automating processes to enhance efficiency, precision, and productivity. We focus on firms engaged in manufacturing and Computer/IT services (software development), as these sectors are crucial for advancing automation technology and integrating innovative solutions.

The analysis identified 696 Polish companies, followed by 397 companies in Czechia, 214 in Hungary, and 185 in Slovakia (Table 6). In all three countries, most industrial automation companies come from the Computer/IT, Electronics, and Machinery industries. Automotives, Energy, and Biotech and Pharma are also significant sources of such companies. Overall, the industrial landscape is very similar, with no major outliers in any country.

TABLE 6. INDUSTRIAL AUTOMATION: COUNT OF VISEGRÁD COMPANIES BY INDUSTRY

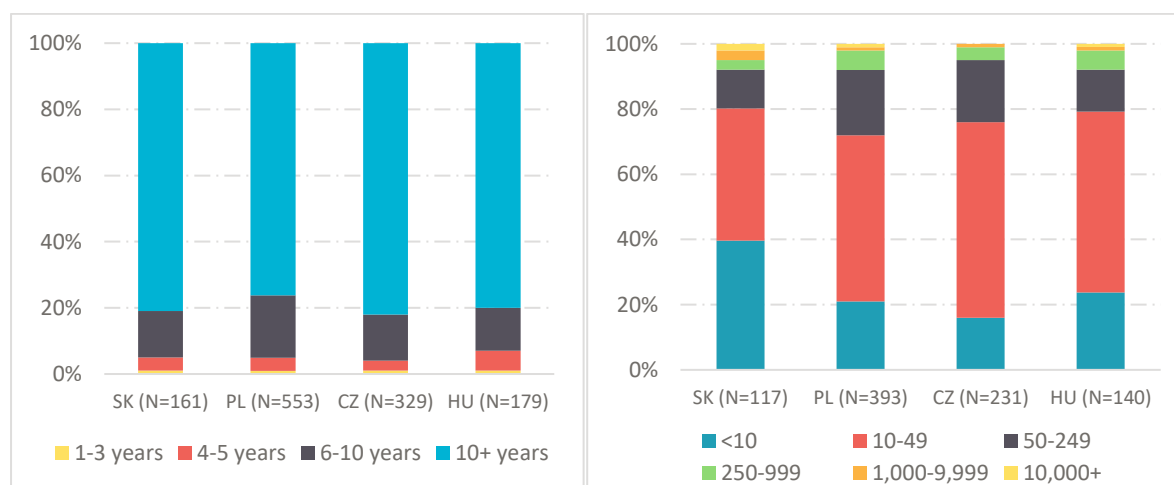
Industry	Slovakia	Poland	Czechia	Hungary
Computer/IT Services	64	298	141	82
Electronics and Machinery	34	100	69	30
Automotives	22	42	32	11
Energy	12	27	30	15
Biotech and Pharma	7	30	18	14
Security	6	21	10	8
Consumer Goods/Retail	6	10	3	1
Aviation and Aerospace	5	21	12	2
Apparel and Textiles	5	6	2	
Medical Devices	4	20	2	4
Agriculture and Fisheries	4	11	12	14
Logistics, Transportation and Warehousing	3	24	7	6
Mining and Metals	2	14	10	2
Food and Beverages	2	14	3	4
Telecommunications	2	13	8	5
Other	7	45	38	16
Grand Total	185	696	397	214

Source: produced by the study team.

Overall, **Visegrád's industrial automation sector is mature**, with over 80% of companies in Slovakia, the Czech Republic, and Hungary being over 10 years old and 77% in Poland. Poland has a slightly higher proportion of companies aged 6-10 years, but all countries have a negligible share of very young companies, with those aged 1-3 years constituting only 1% in each.

In terms of size, **Slovakia is notable for its large proportion of very small companies**, with 40% having fewer than ten employees and 41% employing 10-49 people (Figure 10). This contrasts with other Visegrád countries, where smaller companies are less common. For instance, Poland, Hungary, and the Czech Republic have significantly fewer small firms. Over 50% of companies in Poland and Hungary and 60% in the Czech Republic fall into the 10-49 employee range (Figure 11). Slovakia also has the **lowest share of companies with more than 50 employees**, highlighting its market's fragmented nature with fewer larger enterprises.

FIGURE 10. & FIGURE 11. INDUSTRIAL AUTOMATION: SHARE OF VISEGRÁD COMPANIES BY AGE AND HEADCOUNT*



Source: produced by the study team.

* Considering data limitations, the total number of companies for each country and category is provided in the brackets.

Analysing the **operational activities** of industrial automation companies in the Visegrád region reveals a generally **consistent focus across countries**. The heatmap shows lower involvement in red and higher involvement in blue (Table 7). Most countries emphasise **machinery, hardware, and manufacturing**, which are essential for industrial automation. However, there is a notable difference in design and engineering involvement: around 30% of companies in most Visegrád countries are engaged in this area, while only 11% of Slovak companies are. In contrast, **Slovakia has a higher proportion of companies involved in R&D**, with a quarter engaged in this field.

TABLE 7. INDUSTRIAL AUTOMATION: SHARE OF VISEGRÁD COMPANIES INVOLVED IN DIVERSE ACTIVITIES*

Activity	Slovakia	Poland	Czechia	Hungary
Machinery, hardware & components	55%	55%	55%	50%
Manufacturing & assembly	44%	47%	50%	48%
R&D	29%	25%	32%	26%
Distribution & sales	24%	22%	20%	15%
Logistics, transport and storage	14%	15%	15%	16%
Design & engineering	11%	30%	27%	31%
Operators & providers of management services	11%	10%	11%	11%
Maintenance & repair	10%	7%	9%	9%
Consulting & project management	8%	10%	8%	9%
Recycling & waste management	3%	3%	2%	1%
Raw & processed materials	2%	4%	4%	1%
Critical raw materials	0%	1%	0%	0%
Mining & extraction	0%	1%	1%	0%

Source: produced by the study team.

* All industrial automation companies are involved in Computer/IT services or software development, so software and IT activities are not shown on the heatmap. It is assumed that all companies have this focus.

4.1.1.1 Prominent Examples of Slovak Industrial Automation companies

Below, we provide some examples of prominent companies in Slovakia. These companies focus on innovation and developing advanced technologies within their respective industries, ranging from IT and medical devices to energy optimisation and industrial equipment. They all collaborate with specialised partners or research institutions to enhance their offerings and contribute to industry advancements while also addressing global challenges such as sustainability, efficiency, and healthcare improvement.



ALITER TECHNOLOGIES is a company primarily engaged in the development, implementation, and support of various IT solutions. Established and headquartered in Slovakia, it serves a diverse range of clients, including military and defence organisations, government entities, and private companies. Its core offerings include cybersecurity solutions, software development, and consulting services. ALITER has also shown a commitment to social causes, supporting humanitarian aid and contributing to charitable initiatives.



POWERFUL MEDICAL is a medical device manufacturer that specialises in designing, developing, and distributing software as a medical device (SaMD) for AI-powered diagnostics and treatment in the field of cardiovascular care. The company collaborates with leading cardiologists and research institutions, such as the Cardiovascular Research Center Aalst, to innovate in healthcare and improve patient outcomes. Powerful Medical adheres to SOC 2 standards for data security and has a strong presence in Europe, with plans for global expansion, including the U.S., pending FDA approval.



FUERGY is a company that specialises in energy optimisation. It offers fully automated solutions for more efficient management of electricity production and consumption, utilising its proprietary AI-powered software and hardware. FUERGY's innovative brAIIn battery storage technology provides financial savings to users and eliminates energy waste. FUERGY's solutions have been successfully implemented in various industries, such as the Železiarne Podbrezová iron plant and the National Football Stadium and are making an immediate impact in countries with high renewable energy potential, such as India.



SLOVPUMP is a Slovakian company that has been the largest manufacturer of industrial pumps, water pumps, and water compressors for 75 years. In addition to production, the company offers equipment development, design, service, and diagnostics. SLOVPUMP's advanced pump and compressor solutions are crucial in optimising fluid handling and process efficiency, supporting various industrial and automation applications with reliable and high-performance products.



TESLA LIPOVSKÝ HRADOK A.S. specialises in the automotive industry, specifically in the production and assembly of electric vehicles. The company collaborates with ENSTRA a.s., a provider of high-tech solutions for energy storage and management, and ENERGO DATA spol., which specialises in energy data systems and analytics. The company's activities include designing and assembling electric vehicles, integrating cutting-edge technologies, and pursuing sustainable automotive solutions to address the growing demand for eco-friendly transportation.

4.1.2. Manufacturing companies involved in R&D

This section concentrates on Visegrád companies involved in manufacturing and R&D. It enables the identification of the proportion of manufacturing firms that integrate technological innovations, providing insights into the extent of technological advancement and innovation within the sector.

The analysis of manufacturing companies involved in R&D identified 1,353 companies in Poland, 893 in Czechia, 354 in Hungary, and 291 in Slovakia (Table 8). Overall, the Visegrad region's landscape is quite homogeneous, with most companies in Electronics and Machinery, Automotive, and Biotech and Pharma across all countries.

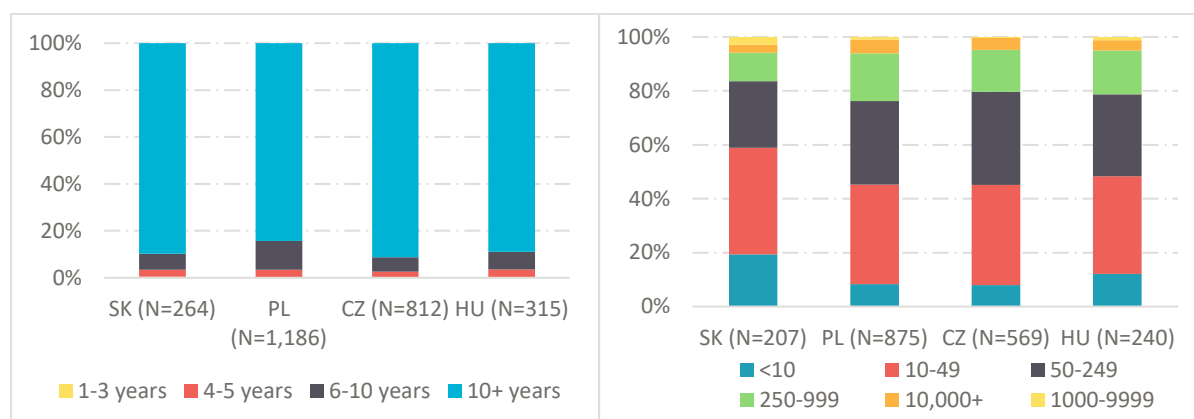
TABLE 8. MANUFACTURING COMPANIES INVOLVED IN R&D: COUNT OF VISEGRÁD COMPANIES BY INDUSTRY

Industry	Slovakia	Poland	Czechia	Hungary
Electronics and Machinery	79	391	252	78
Automotives	57	211	130	69
Biotech and Pharma	29	130	94	64
Agriculture and Fisheries	13	52	42	38
Food and Beverages	12	62	30	12
Chemicals	12	56	37	10
Aviation and Aerospace	11	73	51	9
Energy	11	15	24	2
Medical Devices	10	73	21	19
Mining and Metals	9	79	44	7
Security	8	29	22	6
Apparel and Textiles	7	23	20	4
Construction and Architecture	6	19	24	2
Forestry and Wood	5	12	8	3
Furniture	3	33	11	3
Other	19	95	83	28
Grand Total	291	1,353	893	354

Source: produced by the study team.

Overall, **manufacturing companies engaged in R&D across the Visegrád region are well-established**, with over 80% of firms in each country and 90% in Slovakia over ten years old (Figure 12). Poland has a marginally higher proportion of companies aged 6-10 years, but all countries have a negligible share of very young firms, with those aged 1-3 years representing less than 1% in each. In terms of size, **Slovakia stands out with a significant proportion of SMEs**, comprising **nearly 60%** of firms, including 19% with fewer than ten employees and 40% with 10-49 employees (Figure 13). Other countries have a higher share of companies with 50-249 employees, with Czechia having the largest share at 34%. Notably, Poland has the most substantial proportion of large companies, with 14% employing more than 249 employees, followed by Czechia at 20%.

FIGURE 12. & FIGURE 13. MANUFACTURING COMPANIES INVOLVED IN R&D: SHARE OF VISEGRÁD COMPANIES BY AGE AND HEADCOUNT*



Source: produced by the study team.

* Considering data limitations, the total number of companies for each country and category is provided in the brackets.

Overall, the involvement of manufacturing companies in R&D activities is relatively homogeneous across the Visegrád countries (Table 9). The most common activity in each country is **manufacturing and assembly**, with over 70% of companies participating. The next most popular activity is **machinery and hardware components**, with more than 40% of companies engaged in each country. The third most prevalent activity is design and engineering, involving about a third of the companies.

TABLE 9. MANUFACTURING COMPANIES INVOLVED IN R&D: SHARE OF VISEGRÁD COMPANIES INVOLVED IN DIVERSE ACTIVITIES*

Activity	Slovakia	Poland	Czechia	Hungary
Manufacturing & assembly	72%	71%	75%	70%
Machinery, hardware & components	45%	44%	51%	40%
Design & engineering	31%	31%	31%	29%
Distribution & sales	23%	23%	19%	24%
Software & IT solutions	19%	13%	14%	16%
Raw & processed materials	14%	25%	16%	12%
Logistics, transport and storage	9%	10%	9%	8%
Maintenance & repair	5%	7%	9%	7%
Operators & providers of management services	5%	7%	7%	7%
Consulting & project management	4%	3%	4%	3%
Recycling & waste management	4%	4%	5%	5%
Critical raw materials	2%	4%	3%	2%
Mining & extraction	0%	3%	1%	1%

Source: produced by the study team.

* All companies in this group are engaged in R&D through industrial affiliation or operational activity. Therefore, R&D is not shown on the heatmap, as its representation is effectively 100%.

4.1.2.1 Prominent Examples of Manufacturing Companies Involved in R&D

Below, we provide some examples of prominent companies that focus on advanced technology development and innovation across various high-tech industries, including robotics, automotive systems, IoT devices, battery technology, and machine vision. They all specialize in providing cutting-edge solutions tailored to specific industry needs, with a strong emphasis on research and development to stay at the forefront of technological advancements.



ABC ROBOTICS, S.R.O. is a company that specialises in mobile and industrial robotics. Established over 10 years ago, the company is renowned for its expertise in robotics-related software and hardware development, industrial robot base measurements, and work cell calibration for robots in the automotive industry. ABC Robotics has a

strong presence in R&D, concentrating on measurement systems, robot arms, mobile robots, robot cars, and aerial robots.



LEONI is a company that specialises in wiring systems and cable solutions, with a strong emphasis on serving the automotive industry.

It specialises in providing advanced wiring systems critical for the functionality and safety of vehicles, including electrical wiring for power distribution, data transmission, and electronic control systems. LEONI has established long-standing partnerships with major automotive brands, such as BMW and Mercedes, reinforcing its reputation as a key player in the automotive sector.



GOSPACE LABS is a company that specialises in the innovation and development of Internet of Things (IoT) devices and solutions.

With a focus on urban challenges, the company has also showcased expertise in advanced UAV design, smart city solutions, and smart parking sensors. Their advanced UAVs are designed for sophisticated tasks such as aerial surveillance and environmental monitoring. The company's smart city solutions aim to improve urban infrastructure with technologies optimising traffic management and energy efficiency. Their smart parking sensors provide real-time data to streamline parking management and reduce urban congestion.



INOBAT is a company that specialises in the pioneering research, development, manufacture, and provision of premium innovative electric batteries. The company is based in Slovakia and has a

robust presence in the automotive, commercial vehicle, motorsport, and aerospace sectors. InoBat focuses on advancing battery technology with high-performance, sustainable solutions that offer superior energy density, longer life cycles, and enhanced reliability. Their automotive batteries support the shift towards sustainable transportation, while their commercial vehicle batteries are designed to meet the demands of heavy-duty applications.



XIMEA is a company specialising in developing and manufacturing machine vision cameras that utilise advanced Sony CMOS sensors and high-speed interfaces like USB3. With over a decade of experience, XIMEA offers a diverse range of high-performance

cameras designed for various applications, including automotive quality control, electronics inspection, and scientific research. Their products are renowned for exceptional image quality, speed, and reliability, providing precise imaging and data capture for demanding environments. XIMEA's

cameras come in various models to suit different needs, including low-light and high-speed applications and can be customised to integrate seamlessly into specialised systems.

4.1.3. Software Developing Companies Involved in R&D

In this section, we examine Visegrád companies engaged in both software development and R&D. Analysis of the Slovak automation and robotisation sector shows that Slovakia's Computer/IT industry is not only the largest but also central to the ecosystem, driving technology adoption and providing the infrastructure for technological change. Therefore, focusing on this group helps us understand the key players and ecosystem driving digital technology and innovation in industrial automation.

The analysis identified 197 Polish companies engaged in both software development and R&D, followed by 157 in Czechia, 80 in Hungary, and 64 in Slovakia (Table 10). The industrial landscapes of these countries show slight variations in their dominant sectors. However, the sectors that stand out the most are Electronics and Machinery, Automotives, Biotech and Pharma, and, of course, Computer/IT Services. It is important to note that, by definition, all these companies are either involved in IT through their industrial affiliation with Computer/IT Services or through operational activities, namely Software & IT Solutions.

TABLE 10. SOFTWARE DEVELOPING COMPANIES INVOLVED IN R&D: COUNT OF VISEGRÁD COMPANIES BY INDUSTRY

Industry	Slovakia	Poland	Czechia	Hungary
Electronics and Machinery	18	54	34	15
Automotives	10	25	15	7
Biotech and Pharma	5	23	17	12
Aviation and Aerospace	4	18	11	2
Computer/IT Services	10	18	29	19
Medical Devices	2	14	1	3
Mining and Metals	1	8	4	1
Food and Beverages	1	7	2	1
R&D	4	7	4	5
Agriculture and Fisheries	4	7	10	10
Chemicals		3	2	1
Advertising and Market Research		3		
Furniture		2	1	
Maritime and Shipbuilding	1	2		1
Rubber and Plastic		2	1	
Other	4	4	26	3
Grand Total	64	197	157	80

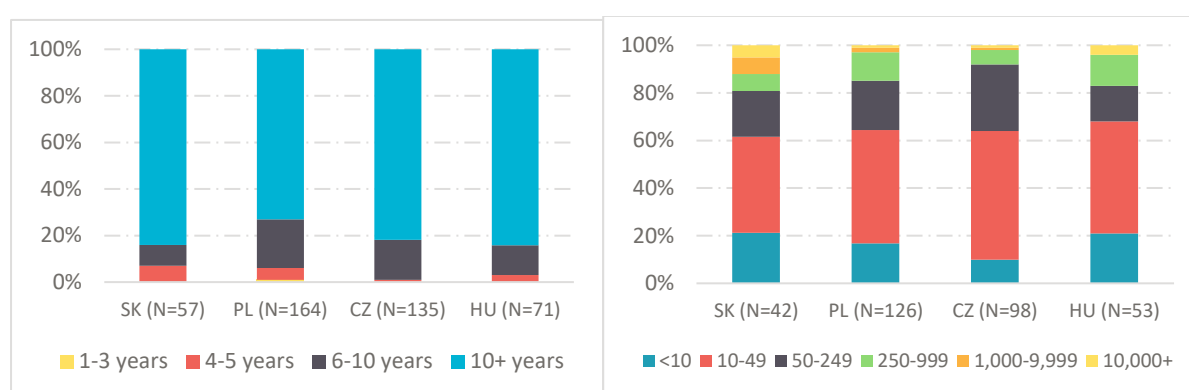
Source: produced by the study team.

Overall, the software development companies in the Visegrád Group involved in R&D are mature, with over 80% of companies in Slovakia, the Czech Republic, and Hungary being over ten years old, compared to 73% in Poland (Figure 14). Poland has a slightly higher proportion of companies aged 6-

10 years, at 21%. At the same time, all countries have a negligible share of very young companies, with those aged 1-3 years constituting only 1% in Poland and none in the other countries.

In terms of company size, the sector is predominantly **characterised by SMEs**, with SMEs constituting the largest share in each of the Visegrád countries (Figure 15). The Czech Republic is notable for having the highest proportion of companies with 50-249 employees, at 28%. **Slovakia has the largest share of companies with more than 49 employees**, at 39%, which includes 12% of companies with over 1,000 employees—the highest proportion in the region. Hungary and Slovakia have the highest proportions of very small enterprises (<10 employees), each at 21%. While these countries feature many micro-enterprises, their SME sectors (10-49 employees) are smaller than the Czech Republic and Poland.

FIGURE 14. & FIGURE 15. SOFTWARE DEVELOPING COMPANIES INVOLVED IN R&D: SHARE OF VISEGRÁD COMPANIES BY AGE AND HEADCOUNT*



Source: produced by the study team.

* Considering data limitations, the total number of companies for each country and category is provided in the brackets.

All companies in this group are, by definition, involved in software or IT solutions and R&D activities (Figure 16). Beyond these core areas, **manufacturing and assembly also play a significant role across the region**, with Slovakia having the highest proportion of companies engaged in these activities at 48%. Additionally, there is considerable involvement in **design and engineering**. Poland leads in this sector with 31% of companies participating, followed closely by the Czech Republic at 28% and Hungary at 24%.

FIGURE 16. SOFTWARE DEVELOPING COMPANIES INVOLVED IN R&D: SHARE OF VISEGRÁD COMPANIES INVOLVED IN DIVERSE ACTIVITIES*

Activity	Slovakia	Poland	Czechia	Hungary
Manufacturing & assembly	48%	45%	46%	39%
Machinery, hardware & components	33%	32%	37%	24%
Design & engineering	28%	31%	25%	24%
Logistics, transport and storage	17%	11%	11%	11%
Distribution & sales	13%	16%	15%	11%
Consulting & project management	11%	8%	7%	6%
Operators & providers of management services	9%	10%	10%	8%
Maintenance & repair	5%	5%	9%	4%
Recycling & waste management	5%	2%	1%	0%
Raw & processed materials	3%	11%	6%	3%
Critical raw materials	0%	2%	0%	0%
Mining & extraction	0%	3%	1%	1%

Source: produced by the study team.

* R&D and Software/IT services have been removed from the heatmap because 100% of these companies are involved in these sectors through industrial affiliation or operational activity.

4.1.3.1 Prominent Examples of Software Developing Companies Involved in R&D

Below, we provide some examples of prominent companies in Slovakia which specialise in cutting-edge technologies across various sectors, including robotics, IT services, biometrics, industrial electronics, and sensor development. They all focus on innovation and the development of advanced solutions tailored to specific industry needs, often integrating sophisticated hardware and software to enhance efficiency, accuracy, and adaptability in their respective fields.



PHOTONEO is a company specialising in the development and production of robotic vision sensors and intelligence software. The company is a leading provider in this field, contributing to the automation of various industries, particularly e-commerce and grocery order fulfilment. Photoneo's high-resolution 3D sensors are pivotal for applications such as bin picking and object recognition, while their software provides sophisticated algorithms for precise object detection and manipulation. Their technology is notably used in e-commerce and grocery order fulfilment, significantly improving efficiency and accuracy in handling diverse items.



DATALAN is a leading provider of IT services. Established over three decades ago, it has built a strong reputation in the industry, working with numerous exceptional talents and personalities. DATALAN specialises in environment management, cyber security, and sports performance, offering solutions in these areas. The company has a dedicated team of experts and has formed strategic partnerships with global leaders such as DELL and Cisco.



INNOVATRICS is a technology company specialising in the development and provision of biometric solutions. Based in Slovakia, the company offers various identity verification services, including facial recognition,

fingerprint identification, and iris scanning. Innovatrics' solutions are designed for various sectors, including mobile operators, healthcare, government, and travel, demonstrating a broad market reach. The company's technology is renowned for its high accuracy, efficiency, and adaptability, including features such as mask detection and pedestrian analysis.

KHAMON.SK

KHAMON is a company specialising in the production of industrial electronics, including electric devices and components. In addition to its core focus on manufacturing, KhaMon provides computer services and data processing solutions. The company is dedicated to addressing customer needs by offering tailored price proposals and developing prototypes based on specific requirements. This commitment to customer service and customisation enables KhaMon to deliver specialised solutions and support within the industrial electronics sector.



RVMAGNETICS is an R&D company primarily focused on producing and developing small passive sensors based on MicroWire technology. The company's flagship product, the MicroWire sensor, is a multifunctional sensor capable of providing contactless, wireless measurements of various physical quantities such as temperature, pressure, and magnetic field. The company's sensors are used in various industries, including composite, rechargeable batteries, civil engineering, electric motors, healthcare, and metal sheet monitoring.

5. Annex 1: Company list (Excel File)

Annex 1 is an Excel file containing the full list of companies identified and utilised for the analysis in this report. The data includes all automation and robotisation companies, as well as companies categorised into the following clusters: 1) industrial automation companies, 2) manufacturing companies engaged in R&D, and 3) software development companies involved in R&D.

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