



**Automation
Region**

***ORGANISING FOR
SYSTEMIC EFFECTS***

Automation Region 2025

Organising for systemic effects

Since the start, Automation Region have participated in more than 100 projects which have involved more than 1000 companies and organisations. Thousands of spontaneous and facilitated meetings have taken place thanks to the activities arranged and the numbers of members have grown to include over 150 active members and partners. This great interest shows that companies and organisations see the value in the network and realise the benefits of the platform.

Being part of an innovation system does however mean that the effects of our activities must be valued in relation to the totality of efforts undertaken by various parties within a specific area. To ensure that efforts undertaken are always based on real industrial needs, Automation Region continuously work with needs analysis. The aim of this recurrent needs analysis is to identify major trends with a transformative potential and in relation to this identify issues of critical importance that will affect the companies within three to five years. Automation Region conducts qualitative workshops around the country where regional companies are invited to identify challenges and opportunities linked to their growth and

development. This is also linked to quantitative surveys that up until now have been conducted with over 1000 small and medium-sized companies throughout Sweden.

The continuous analysis of the industrial needs and the effort of refining the operational model resulted in a consolidation that permeates everything all initiatives and has enabled Automation Region's work as a system integrator. With an overarching purpose of organising for systemic effects Automation Region have made a strategic effort to consolidate the overarching focus, the initiatives engaged in, the parties involved and how to design and use the activities. This effort has resulted in a foundation that drives two primary effects in relation to the strategic vision and goals. The first is an improved ability to take a systemic perspective on why Automation Region should prioritise to do what and for whom. The second is more of a methodological ability to align how and with whom Automation Region should do the things it does to gain scaling effects at a systemic level. Together these two form what is the main aggregated result of phase two of the Vinnväxt programme this far.



Catarina Berglund, Managing Director at Automation Region.

Starting position and development

Below is a short description of the starting position of our consolidation efforts and to what aggregated state the efforts are intended to develop.

	From	To
Focus	Technology and product focus within automation.	Complex industry-wide automation challenges in the context of operational technology (OT) and information technology (IndTech).
Example	Seminars with focus on new technology and it's applications.	Seminars and workshops on industry challenges and possibilities and how technology can help solve and meet these.
Purpose	Focus on challenges that cannot be easily targeted by single actors or specific technologies. Stronger solutions by working industry-wide and technology neutral.	
Initiatives	Detached efforts within smaller initiatives.	Integrating efforts within larger targeted initiatives.
Example	Focus on connecting companies and individuals with common goals.	Focus on how IndTech connect excellence from different areas to meet larger challenges.
Purpose	Build momentum, enable scaling effects, and open for larger co-productive initiatives that to a higher extent can integrate industry-wide actors.	
Stakeholders	Regional network of established automation companies.	Regional, national, and international actors that together have the joint capability and incentive to address industry-wide challenges.
Example	Focus on gathering specialists in the automation area, locally and regionally.	Cutting-edge expertise from around the world from different industries.
Purpose	Strengthening the system by bringing together strong actors with access to their own networks and forming a cluster of clusters with joint capability to address more complex challenges.	
Activities	Activities that enable actors to meet, learn, develop, and innovate.	Methods and processes for co-creation of activities that enable learning, development, innovation, and systemic integration.
Example	Focus on awareness and new contacts.	Building structures and methods that can be scaled to several markets and enhance creation of new knowledge and practical implementation.
Purpose	Develop and provide the underlying structure of <i>how</i> value is created and thereby enabling scaling effects.	

Table 1. Consolidation of Focus, Initiatives, Stakeholders and Activities.

Shifting focus from product to challenges

In the annually undertaken trend analysis several areas that drive development in the industry today were identified. At a more aggregated level three more overarching trends could be identified with the potential to transform the industry; connected industry, intelligent systems, and flexible automation. To give a more refined focus, these three meta-trends have been used to direct most of Automation Region's activities over the past three years. Figure 2 visualise the identified overarching trends in relation to technology drivers and changing conditions.

Connected Industry. The industry is connected and generates a large amount of data which has great potential to be used for automation and improvements in e.g., production, quality, and resource use. As the connected industry impacts everything from production to its end users it is also challenging as it often calls for major changes in how we work, design, and understand the things we do.

Intelligent systems are the computer systems that exhibit an intelligent behaviour by adapting this behaviour based on previous interactions. The automated learning and analysis of such systems are often a critical prerequisite required to realise the value of the data that is generated by the connected industry. When starting to use these systems and

central technologies such as e.g., machine learning (ML) and artificial intelligence (AI) this often comes with both technical, organisational, and social challenges that need to be addressed.

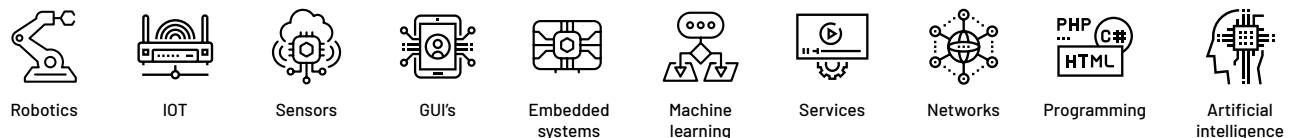
Flexible automation. Industrial production has long been characterized by low mix - high volume but it is facing a distinct change in demand as customers require adaptation and short series. At the same time, small and medium-sized companies are beginning to introduce automation technology and robots to an increasing degree.

To enable the potential value of these three trends it is important to understand that their transformative power is far from merely technical. Besides driving a technical product development, they also drive changes in competence, organisation, value proposition and business models. For these seemingly technology-based trends to create industrial value, these opportunities, challenges, and obstacles must be addressed as one. As a result, Automation Region realised the need to set our overarching focus on the complex industry-wide challenges. The reason is that it is only at this level that these opportunities, challenges and obstacles are acknowledged at a systemic level required to not over-simplify and oversee the critical issues.

The transformative trends of the industry can be summed up by three overarching themes ...



... that are driven by a number of essential technologies ...



... which changes conditions and creates new needs in several areas ...



Figure 2. Transformative trends, technology drivers and changing conditions.

Automation and IndTech

IT and automation in industry are often described using hierarchical information models. What is known as the automation pyramid is established and supported by the ISA-95 standard. But to meet the industry's needs, the automation hierarchies need to be dissolved in favour of more flexible arrangements that can manage a much broader scope of technologies and competences that historically often are in separate organisational functions. However, the industry's large installed base of older but well-functioning technology means that incremental change is generally more likely than sudden disruptive scenarios. In the short term, therefore, the focus is practical integration between technologies, organisations, and companies. In the long term, interoperability with complete sharing of information based on accepted industry standards is the likely development.

To clearly highlight this industrial need to merge its existing, established and implemented operational production technology (OT) and industrial information technology (IT) with novel digital

technology (DT) we will use the term IndTech. IndTech can therefore be seen as a three-way crossing of the industry's operational production technology (OT), the industrial IT area, and the newly developed technology DT. Both industrial OT and IT have roots in the early computerisation of the seventies and both areas are now influenced by new DT such as cloud services, IoT and advanced data analysis.

The conceptualisation of the term, IndTech, was carried out by Automation Region together with partners (Figure 3). Focus of the conceptualisation was to clearly visualise the critical merger of these different established and novel technologies. This highlights how their legacy from being developed in different industries during different time periods comes with different inherited characteristics. When integrated these different characteristics both develop, change, and challenge the conditions for the industry in their digital transformation.

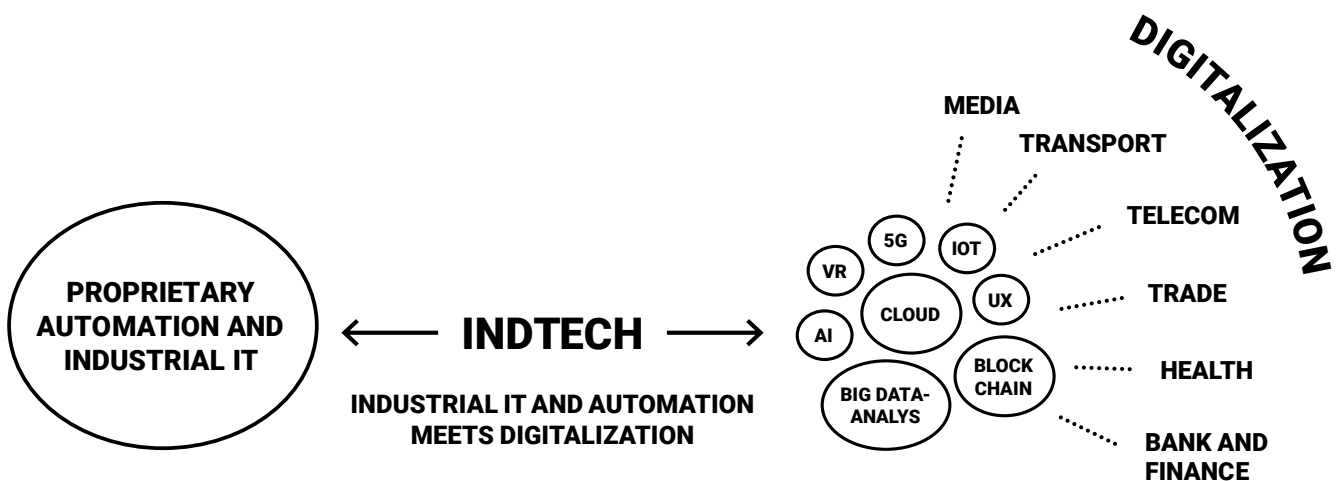


Figure 3. Industrial Technology - IndTech.

An emerging joint meta-cluster

Automation Region has historically had a strong focus on supporting the established companies, and an important part of this is to facilitate the development and access to the correct competence and expertise. Capturing the value and coping with the challenges of the transformative trends that the industry is facing often requires expertise that can be found in other industries, academia, or start-ups.

Therefore, Automation Region has a dual focus on also creating beneficial conditions for both the established companies and other actors such as e.g., start-ups that can provide critical and sometimes hard to find expertise.

Sometimes the expertise is held by young start-ups, other times by large international companies or groups in research institutions or universities. Making it attractive for these to make their expertise available for Swedish companies to accelerate their development is therefore essential for us.

Taking a more systemic perspective on which partners we must team up with and to act in a methodical way, we have started from a model that further develops the Triple Helix model. Figure 4-5 below shows the composition of our partners and members in a regional, national, and international context.

The role of Automation Region in this has been to both function as the platform and to borrow a word from neuroscience, be the signal transmitter which enables the transmission between different actors. Our role is therefore twofold: first to identify, or enable others to identify, how the needs of various interest groups are interrelated and secondly to design initiatives and activities where different actors can be integrated in joint efforts that can address more complex challenges. Focusing on industry-wide challenges we have to a great

extent involved and collaborated with actors from outside the automation companies. Allowing larger co-productive initiatives with their base in industry-wide challenges have also attracted more participants from outside the traditional automation companies.

The vision for Automation Region in the Vinnväxt assignment has been a pronounced international imprint that is described as follows: “Automation Region will be Europe’s leading innovation environment in automation”. Focusing on collaboration to address complex industry-wide challenges within IndTech has taken Automation Region from a regional automation cluster to a leading part in several international initiatives.

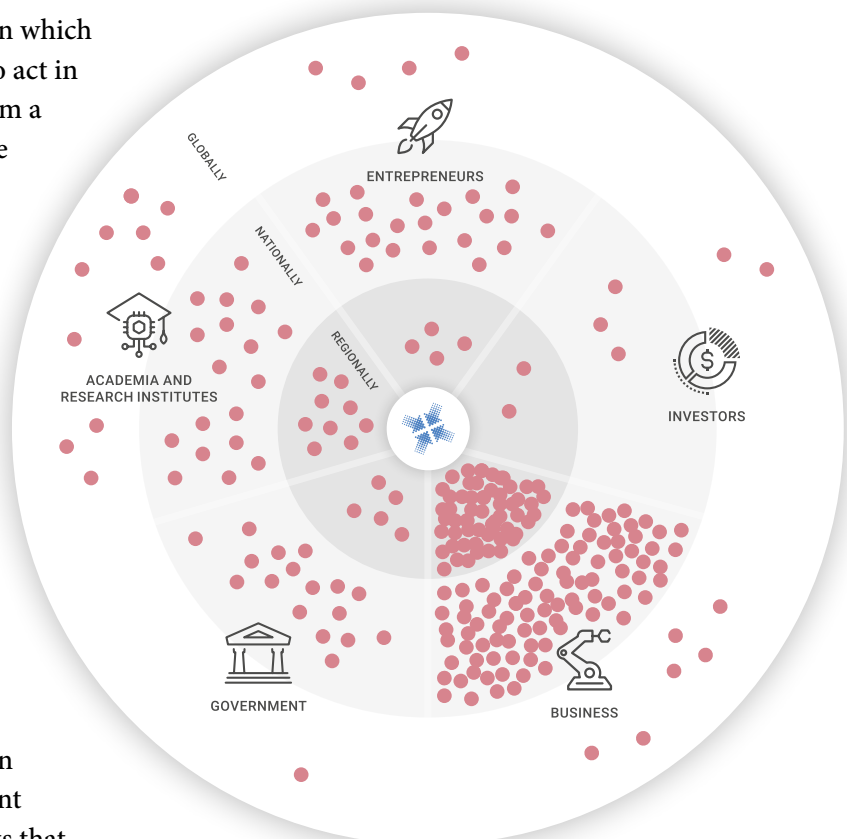


Figure 4. Stakeholder mapping.

Automation Region have strived to make the efforts and collaborations scalable and have deliberately focused on developing methods and processes when building collaboration. In addition, Automation Region have focused on establishing collaboration with other clusters and networks, slowly merging us into a meta-system consisting of several subsystems.

In this meta-system every cluster or sub-system will become a potential hub for collaboration in their area of expertise and depending on the focus of the initiative – Automation Region will take on a national and international position as an emerging hub of industrial automation. Even though the trends might be tech-driven it is important that we in our role also explore, raise awareness, and develop understanding about how humans, society and the environment are affected. Therefore, Automation Region have also taken an active role in involving with people and organizations outside the industry. This broader perspective has given an important input to us when designing our activities.



Figure 5. Automation Region's footprint.



Automation Region with partners at the Elmia Automation fair in May 2024. From left: Louise Brolin, Växjö Linnaeus Science Park, Peter Westerdahl, Visual Sweden, Anna Bird, MITC, Gustav Eriksson, Visual Sweden, Peter Barkenskiöld, Automation Region, the robot 'Hällbert' from Robotdalen, Åsa Nordin, Robotdalen, Petra Årsljö, Automation Region, Daniel Boqvist, Automation Region, and Torbjörn Backman, Robotdalen.

Sustainable innovation



Figure 6. The global sustainability goals.

The global sustainability goals (SGDs) according to Agenda 2030 are integrated into Automation Region's daily work and include all activities, processes, and projects. The achievements described above are also closely related to the achievements of the five SGDs (SGD 3, 4, 5, 9, and 12), exemplified below.

Enhanced skills and equal opportunities

Automation has been part in, and will be continuously, several initiatives and projects to strengthen the skills and the position in the labour market for staff in the manufacturing industry. The goal is for all employees to be offered the same opportunities regardless of gender, gender identity or expression, ethnicity, beliefs, disabilities, sexual orientation, or age.

Focused support initiatives for sustainable industrial development

Automation Region works closely with focused support initiatives for sustainable industrial development by integrating automation technologies into various aspects of industrial processes. By integrating automation technologies with focused support initiatives for sustainable industrial development, Automation Region has an important role in driving positive environmental and social impacts while enhancing the competitiveness of industries.

Initiatives in education and skills supply

Making research results and resources available is an important development area for the industry in Sweden. Compared with many other countries, research projects in Sweden are less commercialised. To create better conditions for making this type of research available, work is required at several levels. Automation Region acts as an intermediary between both Swedish and international universities to increase collaboration between researchers and to build research networks. This aims to contribute to increased collaboration for disseminating research results, but also open for new research domains that can enable sustainable solutions for the industry.

Opportunities to develop local, sustainable production

Automation Region is involved in several projects with the aim to develop flexible and circular production using automation and digitalisation that can be used to make production become more local, flexible, and sustainable. A decreased environmental impact can be achieved through local production based on a flexible value chain.

Going forward

Automation Region is built around the industries of the future with the purpose of accelerating transformation and driving innovation at the system level on a large scale. We work to develop new strategies based on today's needs to build competitive and sustainable industries of the future. By creating a trust-based collaboration platform, the network's members jointly create great value for each other. Together, we educate, train, coach and develop the ability to innovate at the ecosystem level. With a high level of trust and personal contacts, we can identify shared challenges and develop a common ambition to solve these challenges.

Automation Region has the strength to lead and operate complex networks at the system level. The way forward for Automation Region will therefore be to leverage its strengths to act at the system level and function as a player which can bring together Sweden's regional areas of strength and turn these into national resources.

Automation Region will focus on establishing itself as a national player that brings together not only companies but also other cluster environments in a network of clusters. Automation Region has the experience, competence, and trust to lead this type of organisation that can manage complex issues at the system level. Therefore, Automation Region will gear up and bring together other cluster environments that share a common goal, and which can share resources that strengthen the whole.

Going forward Automation Region will continue to be a nation resource in an international context that brings together those who CAN and WANT to be involved to solve complex challenges in a smart and sustainable industry. To become the leading innovation environment in automation and industrial technology, Automation Region cannot act alone.

Strategic priorities

Automation Region's strategic areas are the basis for the projects and activities that are planned and implemented in collaboration with partner organizations and other stakeholders.

- **Increase R&D investments in Sweden.** Sweden is one of the world's most innovative countries, but the competition is intensifying, and it is not time to sit back. The number of companies that are positive about the conditions for R&D investments in Sweden is decreasing, and thus the risk of companies locating R&D operations in other countries is increasing. Therefore, increased public R&D investments, an effective innovation system and competitive market conditions and regulations are required for companies investing in R&D in Sweden.
- **Strengthen the competence development.** Access to skills is one of the industry's biggest challenges. Business is undergoing a strategic transformation marked by climate change and the possibilities of digitization, which requires new knowledge at all levels. The education system needs to maintain both high quality and relevance, and individuals need to have the opportunity for learning and education throughout their working life. A clear mission is required for the higher education institutions to provide high-quality education and further training in collaboration with the business world.
- **Facilitate conditions for the industry's climate transition.** Sweden is to become the world's first fossil-free welfare state by 2045 at the latest. Today, industry accounts for a third of our greenhouse gas emissions, and therefore its transformation is crucial. Automation solutions and new industrial technology are a prerequisite for a climate-smart electrification

of industry. Electricity use is expected to increase exponentially from already high levels, which places demands on a stable electricity grid and access to affordable and emission-free electricity. At the same time, the use of electricity must become smarter and more efficient.

- **Increase the pace of digitalisation.** The overarching goal of Sweden's digitization strategy is to be the best in the world at using the possibilities of digitization. Swedish industry is in the midst of two major changes – a new wave of digitization with AI as a guiding light, and a transformation towards increased sustainability. Both transformations are only in their infancy but have already begun to generate new products, services, and business models. Therefore, it is crucial to change the pace and increase the investments, for example through the expansion of the 5G network, to ensure that Swedish industry can continue to benefit from the new opportunities.

Guiding principles

1. We will further develop the strong Swedish industrial and innovative tradition.
2. We assist companies, entrepreneurs, investors and decision-makers with the right knowledge and tools to take advantage of the great opportunities that automation, digitalisation, and new industrial technology create for a sustainable industry and strong Swedish competitiveness.
3. We want Sweden to be the world's most highly regarded industrial nation!



Award ceremony for Automation Region's competition for the best thesis in the automation field during Scanautomatic fair in Gothenburg on October 9, 2024. From left: William Karlsson (winner), Daniel Boqvist (Automation Region), and Eskil Thulin (also winner).