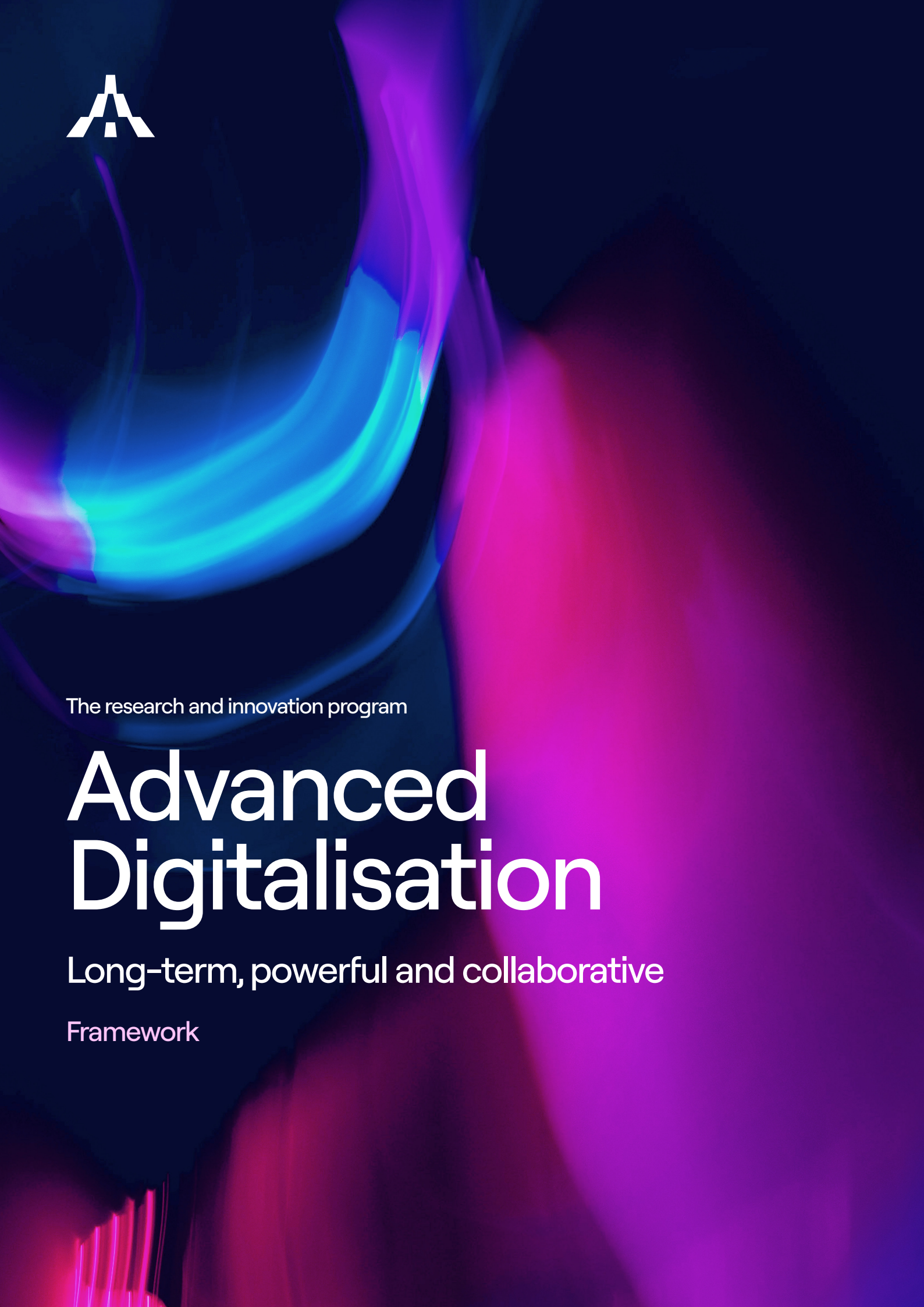

The research and innovation program

Advanced Digitalisation

Long-term, powerful and collaborative

Framework

Contents

We Want

Advanced Digitalisation is based on a vision that Sweden will remain a leading nation in innovation and research. Through joint efforts, we aim to accelerate the development of next generation digital solutions here in Sweden. We strive to promote initiatives addressing relevant and current challenges, thereby fostering mobilization, collaboration, and broad synergies. By doing this, we achieve our goals. We are committed to ensuring that the initiatives we support today build the knowledge needed to develop the advanced solutions of tomorrow.

Pontus de Laval – Chair, Cecilia Sjöberg, - Vinnova, Magnus Frodigh – Ericsson, Johan Lundén – Volvo Group, Christian Hedelin – Saab, Vibeke Gyllenram – ABB (has left the board), Pia Sandvik – Technology Industries of Sweden, Stina Lantz- SISP and Darja Isaksson – Vinnova. (Marie Sandin, Tetra Pak Sweden, has been on the board since December 2024.)

Photo: Viktor Fremling

Preface

The research and innovation program Advanced Digitalisation is a partnership between industry and the state. Our mission is to accelerate and strengthen Sweden's and Swedish industry's capacity to develop advanced, sustainable digital solutions.

The hole world is facing significant challenges related to climate and sustainability, geopolitical uncertainty with increased demands for national security, and intensified global competition. Digital technological development enables these societal challenges to be addressed. It is critical for Sweden's international competitiveness that efforts are increased to strengthen our digital capabilities.

We firmly believe that Sweden can outperform most countries if we leverage our strengths: our unique ability to collaborate between private and public sector, industry with high technical expertise and capacity for innovation. With these capabilities and collective efforts, we can develop our technological leadership and accelerate the digital transformation.

The program's ambition is to be long-term, powerful, and to serve as a platform for national collaboration in advanced industrial digitalisation. Also to contribute to a sustainable, secure, and digitalised Sweden by 2030. The program's participants share a common vision of the need for a powerful commitment to strengthen advanced digitalisation within the industry, contributing their commitment and resources to the program.

We cannot solve challenges such as circular systems, data management, automation, mobility, or security alone. The program's success depends on collaboration, involving both small and large companies as well as participants from academia, research institutes, and the public sector. We look forward to engaging more stakeholders who share our view on the importance of advanced digitalisation and the need for long-term and powerful collaboration.

This framework outlines the program's long-term direction, objectives, and the actions we will take to achieve them. It replaces the previous framework from March 2022.

The Board of the Advanced Digitalisation Program

Pontus de Laval, Chair
Magnus Frodigh, Ericsson
Christian Hedelin, Saab
Vibeke Gyllenram, ABB
Johan Lundén, Volvo Group
Pia Sandvik, Technology Industries of Sweden
Stina Lantz, Swedish Incubators & Science Parks (SISP)
Darja Isaksson, Vinnova (Sweden's innovation agency)
Cecilia Sjöberg, Vinnova

The goals of Advanced Digitalisation

Advanced Digitalisation is an industry-driven research and innovation program aimed at promoting and accelerating Sweden's and Swedish industry's capacity to create the digital solutions of the future, thereby driving the necessary transitions we face. This is achieved by funding demand-driven research and innovation initiatives and establishing cross-sectoral structures for collaboration.

Advanced Digitalisation refers to the new opportunities generated by high-tech achievements in fields such as electronics, communication technology, software-intensive systems, as well as open data and industrial platforms. Successful development of secure data and system-of-systems solutions can contribute to the development and adoption of next-generation advanced digital solutions in Sweden.

Our vision is that Sweden and Swedish industry should be among the global leaders when it comes to the digital and green transitions. Our mission is to contribute to the development of advanced technologies in Sweden and to ensure that they are adopted by a broader audience. The ambition of Advanced Digitalisation is to be a long-term and powerful initiative, fostering broad collaboration and to play a central role in Sweden's innovation system for industrial, advanced, and innovative digitalisation. To promote coordination and knowledge-sharing, the program aims to serve as a platform for collaboration and knowledge for other Swedish initiatives within the field of digitalisation.

The program aims to contribute to the following six goals:

1. To contribute to the next generation of advanced, powerful and secure digital solutions – developed in Sweden.
2. To strengthen Sweden's attractiveness for research and innovation investments.
3. To ensure increased competitiveness for the industry operating in Sweden.
4. To help elevate the Swedish business sector's expertise and implementation capacity in the field of advanced digitalisation.
5. To serve as a collaboration platform and work as a knowledge hub for other Swedish initiatives in the digitalisation field.
6. To contribute to society's digital transformation, sustainable development, and the efforts to achieve Sweden's environmental goals.

Key highlights of Advanced Digitalisation

- The Advanced Digitalisation is focusing on horizontal data flows between different systems and organisations in the value chain, in industry-related contexts.
- The Program was launched in spring 2021 through an initiative by ABB, Ericsson, Saab, Teknikföretagen (Technology Industries of Sweden) and Vinnova (Sweden's innovation agency)
- The program's ambition is to continue at least until 2030 with an annual budget of SEK 2 billion.
- Half of the program's budget comes from public funds; the other half is co-financed by industry.
- The Swedish government has strengthened public contributions by allocating SEK 300 million for 2023 and at least SEK 500 million annually for 2024–2027 through a government assignment given to Vinnova.
- With equal funding from companies and other project partners, the annual budget will amount to SEK 1 billion per year during 2024–2027.
- As of January 2024, the program's board includes members from ABB, Ericsson, Saab, Volvo Group, SISP, Teknikföretagen, and Vinnova.
- The preparatory group serves as the board's working committee and comprises the same organisations as the board.
- The program office for Advanced Digitalisation operates as an innovation cluster hosted by Teknikföretagen (Technology Industries of Sweden).
- Many stakeholders contribute to the program's work and development through the board, the preparatory group, the program office, the program council, and the Advisory Board.
- The program operates within four areas of intervention that individually and collectively strengthen Sweden's attractiveness: applied research and innovation, open test and demonstration environments, learning and education, and a dialogue and collaboration arena.
- The program employs a broad toolbox, with open competitive calls as its central instrument.
- There is a focus on strategically important, large-scale projects where research, test environments, and knowledge-sharing are integrated. In addition to open calls, funding may also be provided through targeted grants for specific projects.
- Vinnova is the authority responsible for managing the public funding for the program and its projects.

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At the forefront of the digital transformation

Swedish companies must continuously stay at the forefront of the digital transformation to compete successfully on both the Swedish and the global markets. In countries such as Finland, Germany, the UK, France, South Korea, and the USA, significant investments are being made in digitalisation. Additionally, these countries are raising their ambitions and allocating substantial resources to strengthen their capacity for rapid digital transformation.

Further investments in applied research are crucial for maintaining a strong Swedish position in the digital transformation. This includes investments in the technology itself, but the digital transformation also brings changes in how organisations are structured and integrated with one another, business models, and the need for changes in regulations. All these changes must be captured through the program.

In collaboration with others

With an industry characterised by high technical expertise, high capacity for innovation in both small and large companies, a well-developed digital infrastructure, and a unique ability to collaborate across sectors, Sweden is well-positioned to succeed in the digital industry, both in the EU and globally. These strengths must be harnessed through Advanced Digitalisation. The program will become a natural platform for collaboration in advanced digitalisation, where we can collectively capture future global signals and thereby define a shared direction for Sweden.

By deliberately and systematically building a collaboration platform with other key initiatives in the digitalisation area and between leading players from various industries, the outcomes of the program can be even more significant. Examples of other initiatives we wish to collaborate with include the strategic innovation programs, Impact Innovation (in particularly NetZero Industry), The Wallenberg AI, Autonomous Systems and Software Program (WASP), networks for small businesses and startups, existing test and demonstration environments, national programs in 6G, and civil-military synergies, among others. By involving a wide range of participants in different parts of the program, we establish a solid foundation for broad collaboration.

For long-term change – we need a clear path, speed and determination

The digital transformation is too slow in Sweden, which is one reason why Advanced Digitalisation was formed. What we do here and now must aim to achieve long-term change. The program's scope, long-term focus, and the commitment from the industry are crucial for being able to deliver on the program's overall goals. It is through competitive Swedish companies with strong digital capabilities that we can create a digitally advanced Sweden. However, Swedish industry faces challenges in the digital transition. It is only when these challenges are addressed that the industry can truly begin to deliver the goals and achieve the rapid and lasting change we need.

The program´s driving purpose

Advanced Digitalisation places Swedish industry at the forefront and strengthens Sweden's ability to develop advanced digital solutions by addressing the common challenges faced by industry. We have identified several challenges, and below we explain how the program will address them.

Challenges	What we do
There is a lack of infrastructure for test and demonstration facilities in real-world environments for high-tech research that can be shared and used by many different stakeholders.	We focus on creating and increasing the use of existing real-world, open digital infrastructures for testing and demonstration, where new technologies can be developed and adapted.
There is a significant global shortage of skills in the ICT sector, and as a small country, Sweden may struggle to compete.	We promote investments in continuous learning in projects and within organisations, as well as initiatives coordinated with higher education institutions to produce and attract digital experts in sufficient numbers and with the right skills.
Innovation efforts in the digital sector are short-term and fragmented, not making long-term impacts.	We invest long-term, focusing on large, strategically important projects where research, test environments, and knowledge sharing are integrated, and coordination between different initiatives within the program maximises the outcome.
Sweden needs significantly larger investments for digital mobilisation to compete in the international arena.	We aim to implement initiatives with a budget of two billion SEK per year and ensure investments in strategically important projects while involving many stakeholders who spread the knowledge further.
The potential in the digital transformation of the business sector can only be realised if it is done in collaboration with the state and the public sector.	We are a collaboration between the state and the private sector, with each contributing equally.

Challenges	What we do
Different competencies need to collaborate to create solutions in new constellations.	We support collaborative research and build cross-functional structures that involve various competencies from industry, academia, research institutes, the public sector, and more.
An advanced level of digitalisation requires continuous flows between different systems of various organisations.	We focus on horizontal, secure data flows between system-of-systems, where the flow occurs automatically, securely, and sustainably.
Strengthening the capability of next-generation advanced digital solutions requires efforts from different perspectives.	We work with four areas of interventions that form a whole: Applied research and innovation, open digital infrastructure for test and demonstration environments, learning and education, and a developed dialogue and collaboration arena.
The international perspective is becoming increasingly important, especially in the digital sector.	We implement initiatives that contribute to positioning Sweden internationally and strengthening Sweden's global attractiveness for customers, talent, and innovations.
Historically, the gender distribution in technology and digitalisation has been uneven, with men dominating technical professions. Gender and diversity are crucial factors that indirectly impact societal development.	We promote and strive for an equal gender balance in the groups formed within Advanced Digitalisation.
The digital transformation needs to be a collective effort.	We work for mobilisation and dialogue across traditional boundaries through our own and others' collaboration platforms.

Advanced Digitalisation – A multi-billion initiative

In March 2023, the government announced that the state would contribute SEK 2.3 billion to Advanced Digitalisation through to 2027. In this way, a multi-billion investment is currently underway, as the partnership is based on the industry matching the state's contribution with an equivalent amount. With this budget, Advanced Digitalisation has the opportunity to fund initiatives that truly make a difference. However, the partners' ambition is higher, aiming for the program to continue until at least 2030 with an annual budget that doubles during this period.

A powerful, comprehensive, and long-term program is essential to achieve the stated goals and results. Each individual project represents an important step in development, but the real strength lies in the collective progress of multiple projects and participants moving in the same direction, learning from one another, and spreading knowledge further. In other words, the program becomes a mechanism that gradually contributes to achieving the objectives.

Technology and challenge-driven

To be among the global leaders in digital transformation requires knowledge and expertise in how new digital technologies can be developed and used efficiently and innovatively. Advanced Digitalisation is about creating research and development environments for complex systems where key development/technology tracks can be pursued.

The program has specifically identified the following key technology tracks:

- **Secure digital platforms** for efficient development, production and support.
- **Autonomous systems** development, optimisation, and architecture for reliability and collaboration.
- **End-to-End AI** in development, production and services.
- **Edge computing, cloud technology, 5G/6G networks** and software-defined networks for industrial applications.
- **Cybersecurity** for advanced industrial digitalisation.
- **Data-driven development** and secure exchange of data between processes and organisations.
- **Model- and simulation-driven development and optimisation,** including the use of digital twins.
- **Software development,** including reuse and security control when using open-source solutions.

In complex digital systems, equipment or technology tracks need to operate cohesively with systems from other equipment and technology tracks. The Advanced Digitalisation program aims to ensure that these technologies can be tested in industry-relevant contexts, with examples of application areas being mines, ports, airports, etc.

An important issue for the development and competitiveness of industry is achieving horizontal data flows between the systems of different organisations. This concerns an advanced level of interoperability with an uninterrupted flow of secure data through systems of systems. It is a particularly challenging issue that requires new forms of collaboration in digital value chains.

Advanced Digitalisation has identified five thematic areas that are particularly important for industry and relevant to the program:

Digital infrastructure and communication

The program's focus on interoperability as well as smart and secure data flows places digital infrastructure at the forefront.

Electrification

The transition requires new technological development where digitalisation is a key tool in the interplay between various infrastructures: digital infrastructure, energy and electricity grids, and transport.

Digital resilience and cybersecurity

The industrial digital environments and data flows are becoming increasingly complex, while interruptions and disruptions are having greater consequences. Digital resilience and cybersecurity are growing in importance as societal preparedness (both civilian and military) needs strengthening.

Circular industry

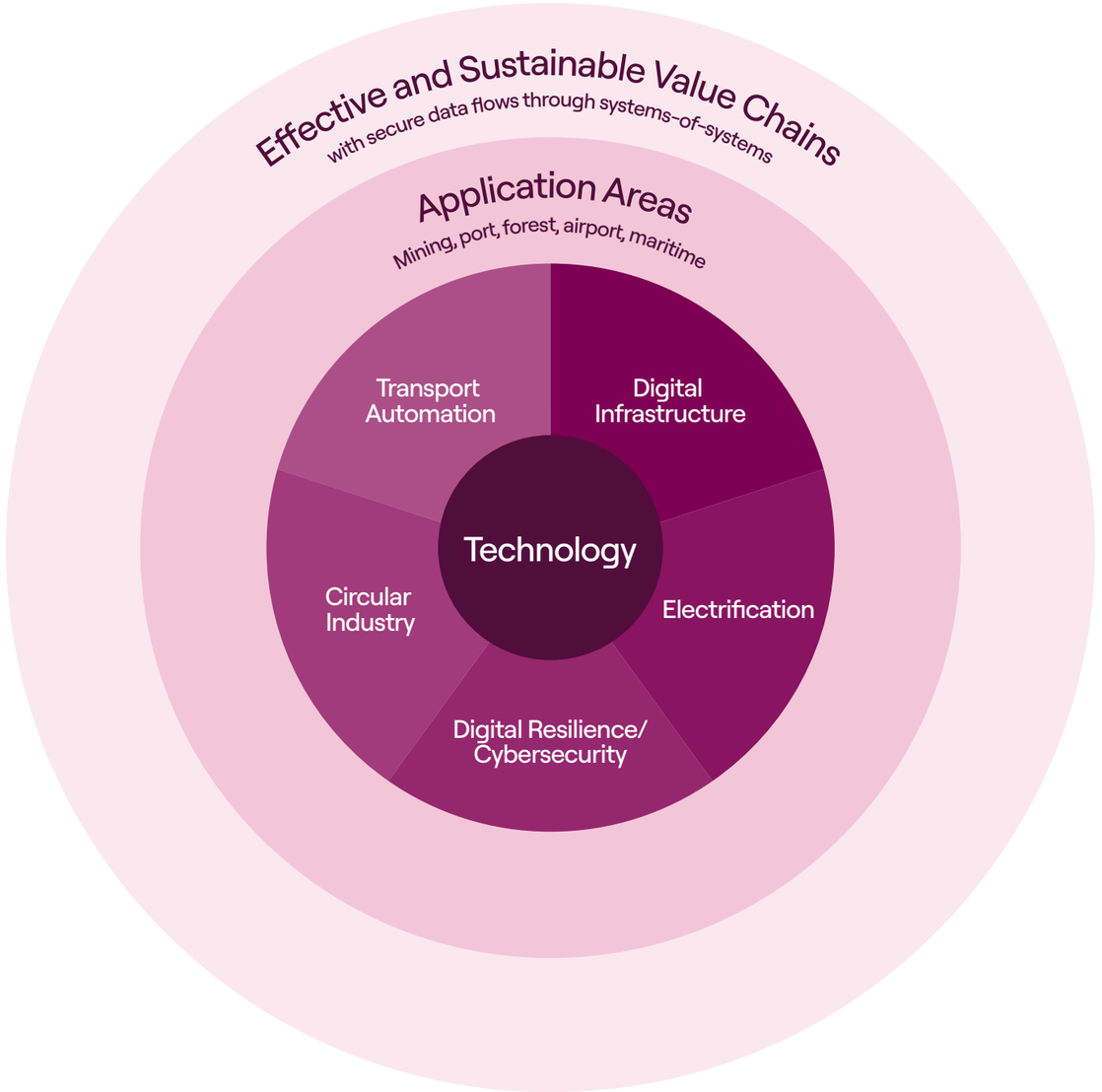
Access to data flows is key to the solution, as is a secure and robust infrastructure where the technical systems and platforms of various organisations can communicate with one another.

Transport automation

Digitalisation is a crucial driver for making the entire transport system and all modes of traffic more seamless and efficient.

Program logic

The contexts in which challenges arise can vary in nature: technical challenges, thematic challenges, and application challenges. We utilise all these contexts to identify the need for interventions. These contexts are illustrated in our program logic. The program's interventions can target different parts of the program logic.




Together we need to act decisively and with a long-term perspective to strengthen the transformation of Swedish industry.

International colloboration

Advanced Digitalisation aims to enhance the Swedish business sector's competence and implementation capabilities, with the goal of strengthening Sweden's brand in the field of advanced digitalisation. The primary objective of our international connectivity is to promote visibility and influence. In the longer term, the program's activities should contribute to strengthening Sweden's position as a leading digital innovation nation internationally, thereby attracting investments in research and innovation (knowledge and capital).

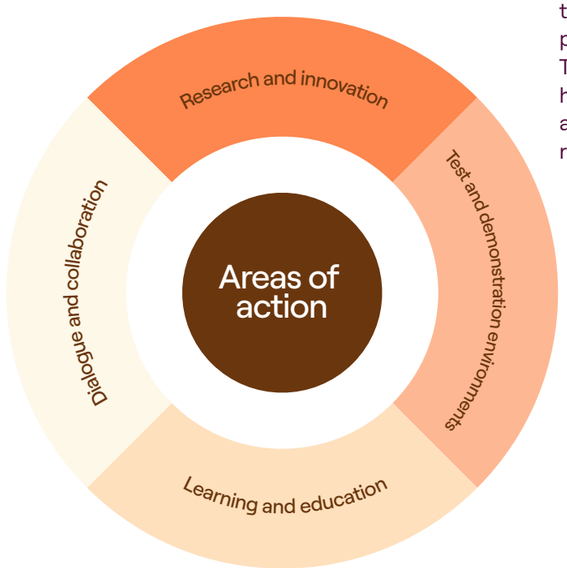
The program's efforts should result in more and larger research and innovation projects being initiated. A desired outcome is stronger links to international research and innovation programs, particularly within the EU’s key funding programme for research and innovation Horizon Europe (and the upcoming FP10).

Actions to strengthen essential capabilities

Advanced Digitalisation is intended to be a cohesive industrial program supporting the continuous development of both fundamental and specific capabilities. These capabilities are vital for Sweden’s development of the components, systems, and system-of-systems solutions required for the next generation of advanced digital solutions.

The program will consist of new investments in research and innovation combined with collaboration with existing initiatives. It will also ensure an open digital infrastructure for testing and demonstration environments, learning and education and a structured platform for dialogue and collaboration. Achieving the program's vision and goals, requires contributions from all four areas of intervention. Together, these areas represent a critical force within the program and aim to create a ripple effect across the business sector, public authorities, and organisations. Each area contributes to the goals, but the significant impact lies particularly in the synergies between them and the long-term perspective.

By fostering initiatives that address the identified challenges and creating research and development environments that cover the critical thematic/ technology tracks while enabling synergies across areas of intervention, we aim to achieve our six goals.



Advanced Digitalisation seeks to attract participants from industry, universities, research institutes, public organisations, and other stakeholders by offering involvement in exciting and groundbreaking projects. The program's processes will be characterised by openness and transparency, particularly in the allocation of its budget and the selection of projects. The main principle is that funding is distributed through open calls, and selection based on free competition. Examples include feasibility studies, strategically significant projects, research and innovation projects, lighthouse projects, innovation contests, competence centers, project proposals from other programs, and support for Swedish participation in international projects.

Advanced Digitalisation places special emphasis on strategically significant projects where multiple areas of actions are integrated within a project. These projects are characterised by their long duration over multiple phases, relatively large budgets, and involvement in several digital technology fields. Funding to address needs of a specific nature can also be provided through targeted grants (individual projects).

Vinnova (Sweden's innovation agency) is responsible for the government funding allocated to the program. They manage the program’s calls, oversee the assessment and decision-making processes for projects, and the projects implementation processes. The Swedish government has directed Vinnova to handle public financing for the program up until 2027 and has required the agency to provide follow-up reporting.

Communication as a strategic tool

Communication is both an important strategic means and an integrated tool in various activities aimed at realising the program's vision, roadmap, and impact goals. Sharing information about Advanced Digitalisation and creating opportunities for dialogue, collaboration and knowledge sharing are central to the program.

We achieve this by participating in relevant national and international forums, highlighting and disseminating results and inspiring examples through various channels such as our website, newsletters, LinkedIn, informational meetings, seminars and conferences.

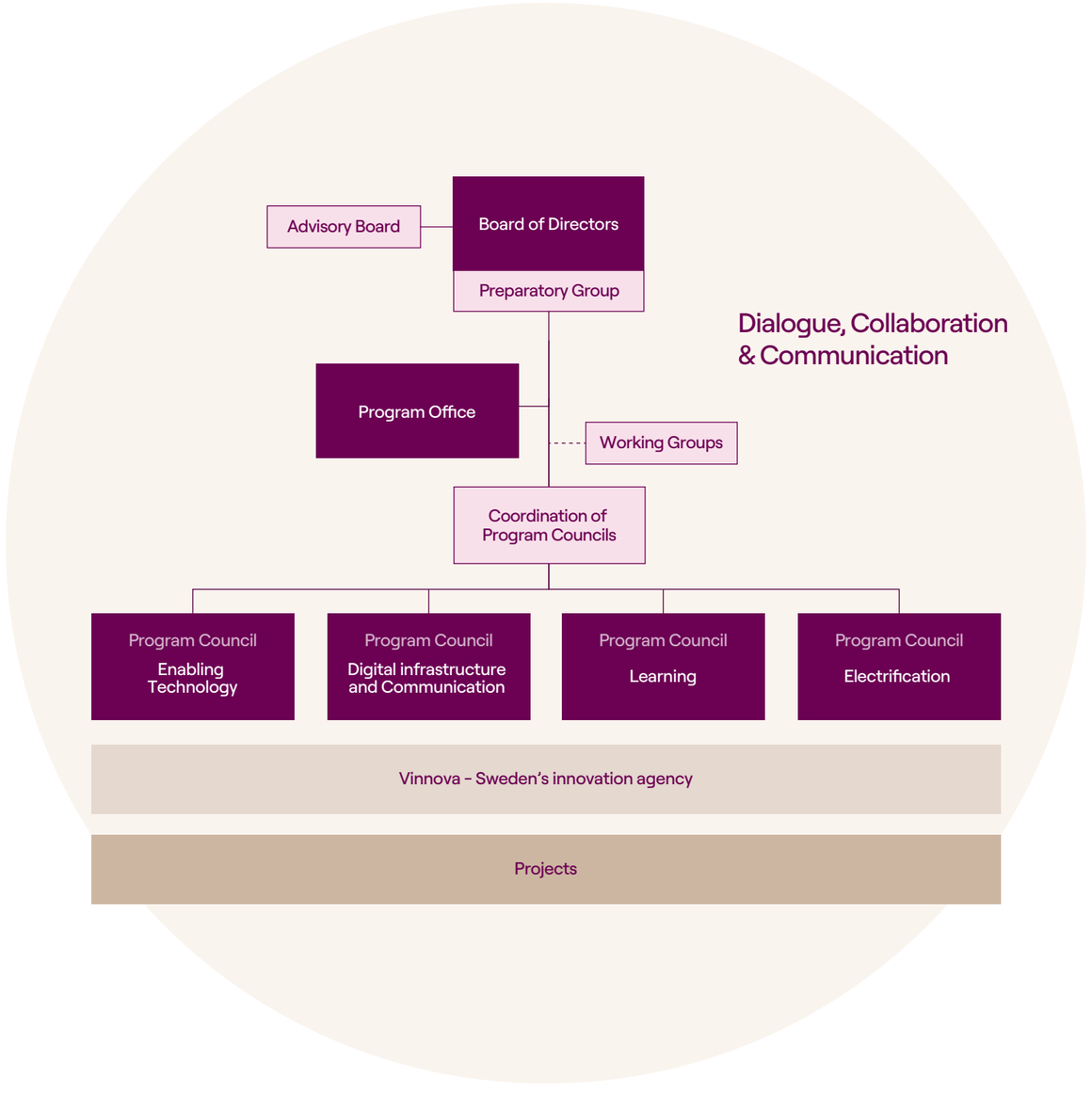
Through the recurring event Meeting Place for Advanced Digitalisation, we bring together participants from projects funded by Advanced Digitalisation and other stakeholders. This event offers a mix of inspiration, networking, knowledge exchange and presentations of project results.

An organisation that provides structure and involvement

Advanced Digitalisation is designed to play a key role in the Swedish innovation system in terms of industry-focused, advanced, and innovative digitalisation. It aims to contribute to broad and long-term efforts by mobilising adequate resources. The program has chosen an organisational structure that ensures it is governed based on the needs of the industry, technological and scientific developments, and the global competitive landscape.

The program's success depends on involving participants with diverse expertise and identifying relevant initiatives. Its organisational framework accommodates this by engaging a wide range of stakeholders in the board, strategic councils, program councils, and, most importantly, through the projects. The program's governance is outlined in its rules of procedure, which are approved by the board.

- The program is led by a board comprising members from industry, government and industrial organisations.
- The preparatory group acts as the board's working committee.
- The Advisory Board, established by the board, serves as an external advisory council.
- The program office manages and develops the program's ongoing operations.
- Program councils, composed of representatives from various organisations, are tasked with planning, driving, and developing activities in designated areas within the program. These councils are appointed by the board.
- Vinnova is the responsible authority for the program and oversees the funding of its projects.



Impact logic for Advanced Digitalisation

Activities	Results	Short-term effects	Long-term effect
Investments in applied research covering key technology tracks, themes, and application areas.	Measurable development milestones within the program's priority technology and theme areas.	Built knowledge today to develop tomorrow's advanced solutions.	Contribute to the next generation of advanced, powerful and secure digital solutions – developed in Sweden.
Development of a platform for dialogue and collaboration.	Creation of realistic and open digital infrastructure for testing and demos where new technologies can be developed and adapted.	Accelerated and strengthened Sweden's and the Swedish industry's ability to create the advanced digital solutions of the future.	Ensure increased competitiveness for the industry operating in Sweden.
Initiatives across all four areas of interventions.	A project portfolio demonstrating progress towards short- and long-term impacts.	Contributed to Swedish leadership in the digital transformation.	Strengthen Sweden's attractiveness for research and innovation investments.
The state and the private sector contributing equally (financially).	A long-term partnership between the state and industry.	Clear examples of successes linked to advanced digitalisation.	Contribute to enhancing the Swedish business sector's competence and implementation capacity in advanced digitalisation.
Funding distributed through open calls, as the central tool for allocating funding.	Increase the number of digital experts.	Increased collaboration within and between industries in advanced digitalisation.	Contribute to society's digital transformation, sustainable development, and efforts to achieve Sweden's environmental goals.
Strategically significant, large-scale projects may be financed through targeted grants (individual projects).	Maximise the potential of the project portfolio through coordination within the program.	Successful and faster development of secure data and system-of-systems solutions.	Serve as a collaboration platform and function as a knowledge hub.
Emphasis on strategic projects where research, test environments, and knowledge sharing are integrated.	A project portfolio contributing to lower climate footprint and improved digital resilience.	A central role in the Swedish innovation system regarding industry-related, advanced, and innovative digitalisation.	
Cooperation with other relevant Swedish initiatives in the digitalisation area.	Dissemination of generated knowledge beyond the program.	Stronger connection between Swedish research and the industry's future needs in advanced digitalisation.	
Promote initiatives for continuous learning in projects and organisations.	Creation of cross-cutting structures that foster collaboration in new constellations.	Improved Swedish position in technical areas of strength.	
Coordinating efforts across different initiatives within the program.	Horizontal secure data flows between systems where the flow occurs automatically, securely, and sustainably.		
Ensuring uninterrupted and secure data flows between systems of different organisations.		Maximised outcomes from the project portfolio through noticeable spillover effects both within and outside the program.	
Collaboration, promotion, and information exchange with individuals, institutions, and initiatives in other countries.	Spread information and knowledge about the program to other countries and acquire similar knowledge from them.	Contributed to the program being perceived as relevant and visible in other countries.	
Alignment with EU's key funding programme for research and innovation – Horizon Europe.	Links to international research and innovation programs, particularly Horizon Europe.	Contributed to increased awareness of available funding in international research and innovation programs.	
Development of a gender equality plan for Advanced Digitalisation.	Clarify the focus and ambition of Advanced Digitalisation regarding gender equality work. Promote gender balance in the groups formed within Advanced Digitalisation.	Contributed to a more balanced gender distribution in the groups formed within Advanced Digitalisation.	
Participation in relevant national and international forums.		Strengthened Sweden's position as a digital innovation country internationally.	
Create opportunities for dialogue, collaboration, and knowledge exchange.			
Disseminate project results and initiatives through various channels.	Broad and long-term mobilisation with adequate resources.		
Regular conference: "Meeting Place for Advanced Digitalisation".	Mobilisation and dialogue across traditional boundaries via our own and others' collaboration platforms.	A meeting point for collaboration within advanced digitalisation.	
Design an organisation that ensures structure, relevance, and broad involvement.			

Advanced Digitalisation

Read more about our work at
avanceraddigitalisering.se

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