NATIONAL POOLING OF RESOURCES FOR INDUSTRIAL PROCESS AUTOMATION

– an agenda for leadership, innovation and skills development

CONTENTS

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AGENDA FOR LEADERSHIP, INNOVATION AND SKILLS DEVELOPMENT

Agenda proposals for specific, long-term activities provide a range of major advantages to participating process industry companies and process industrially oriented operators that are active in Sweden:

- An engine in the development of internationally leading industrial process automation solutions through a collaboration between the process industry, suppliers, universities, colleges and institutes where the work is associated with robust RDI environments in order to ensure that innovations and solutions quickly move from opportunity to benefit.
- Collaboration with industry to increase the gross supply of engineers through targeted investments in basic education, higher education and for improved labour immigration.
- Tools for the flexible production of high quality niche products and services that when compared internationally, provide superior production economy.
- Long-term competitive supplier companies with effective product development and access to demanding local markets for reference sites.
- Lower capital tie-up and quicker return on investment.
- Streamlined processes through optimal production in facilities with high availability.
- Knowledge and skills that are needed to take advantage of, and invest in, new knowledge-intensive processes, innovations and solutions.
- Increased attractiveness for process engineering and supplier companies as employers of domestic and global talent. An industry that gives priority to safety and high skills and has an excellent potential for allowing people to develop.
- Increased available capital for early innovation projects and stronger international collaborations and alliances. More knowledge about trends and changes in the world.
- More efficient purchasing, sales and distribution methods.
- Benefit from new technologies that enable new innovations in the area and reduce the knowledge gap between suppliers and users.
- Strong long-term commitment to the environment through sustainable and effective solutions that meet current and future climate challenges.
- Generally **improve our overall innovation, business and engineering skills**.

INTRODUCTION

Industrial process automation is a key area for Sweden where many Swedish companies are world leaders in terms of development, supply and application. The area is very important in order to maintain and further develop a competitive national process industry. The area is made up of a global market with growth potential for SMEs where they can grow by developing and commercialising innovations through corporate, university, college and institute collaborations.

The fact that Sweden emerged as one of the most successful welfare states post war is strongly linked to the development of the Swedish process industry.

The claim that forests, ore, and hydropower provided the foundation for the rapid rise in the welfare state is no exaggeration. Expansion in the industry has delivered export revenues, jobs, new products and world-class research. Over the years, a constant flow of new innovations has emerged and contributed to work opportunities and valuable export earnings. From this tradition the process industry has evolved to develop new, refined products with high-tech advancements. This has frequently been in the form of R&D collaborations between state companies and agencies and large private manufacturing companies. A collaboration that has resulted in world-class products and world leading manufacturing companies, and also applies to automation and engineering companies.

- The process industry and its suppliers are crucial to the value of Sweden's exports, employment, investment and sustainable national competitiveness.
- Refining our raw materials efficiently and in an environmentally friendly way is a vital national concern.

Emerging economies are shifting the balance of the world economy. While the US and Europe have growth problems, Asian economies in particular are expanding rapidly. This is creating new competitive conditions in global markets. Swedish companies and enterprises active in Sweden must constantly reinvent themselves by applying greater knowledge, expertise, innovations, technology and product development to remain at the forefront in terms of competitiveness. This applies to the major companies, but is also a prerequisite for small and medium-sized businesses in order to ensure they are able to evolve into tomorrow's large-scale corporations.

The ability of companies to succeed in developing more products and innovations with a high added value is a basic requirement for more high paying jobs in Sweden, which in turn grows the country's future prosperity. The process industry with its major supplier industries is sometimes taken for granted as an obvious engine for driving our country's economy. If this trend is to continue and further develop, favourable conditions must be created and maintained to ensure the industry's future challenges can be turned into opportunities.

- For the process industry and its suppliers, increasing globalisation brings with it intensifying competition.
- As the baby-boom generation of the 1940s is now retiring and global competition intensifies, the industry is in dire need of skills development and skills provision.
- Globalisation manifests itself in ever-increasing demands for productivity, quality, yield, recovery and new products or product enhancements.
- Environmental standards and regulatory frameworks are setting new, challenging and important demands.

[1] Från IVAs innovationsplan Sverige.

SUMMARY

The emergence of the Swedish welfare state is closely linked to the development of the process industry in Sweden. Industry expansion has delivered crucial export revenues, work opportunities, new products and world-class research

The emergence of the Swedish welfare state is closely linked to the development of the process industry in Sweden. Industry expansion has delivered crucial export revenues, work opportunities, new products and world-class research.

Today, a quarter of a million people work in the process industry. Add to this all the work opportunities created indirectly by subcontractors, equipment manufacturers, consultants and others. If you add up the amount of money the processing industry turns over annually with its supplier company's turnover, the figure is close to SEK 1,000 billion.

The process industry accounts for the lion's share of the total industrial investment in Sweden. 60 percent of the Swedish national household's total export earnings comes from the process industry, which represents around 13 percent of Sweden's total GDP.

The challenges presented by our globalised world are not only fierce competition, but also opportunities for the process industry and its suppliers. The Swedish automation industry is among the very best in the world with an annual turnover of SEK 50 billion. A EU report estimates the global market for automation solutions at nearly EUR 188 billion for 2007. The same report estimates that in 2012 the market will hit EUR 278 billion.

Our vision is that by 2025 Sweden will be the leading nation in the area of industrial process management and automation. But achieving this goal requires more energy, resources and focus. Implementation of the vision will require substantial investments in research, development and innovation (RDI) with greater collaborations.

Today we are seeing more threats and weaknesses in our ability to maintain and enhance our strong position in the area.

»We are proposing a major investment in national RDI programs of about SEK 200 million per year with a corresponding amount of financing from the industry.«

It is not easy today getting a complete picture of the activities available among universities, colleges, institutes and other RDI operators. There are no figures indicating the scope of the activities in the area. The interviews conducted during the preparation of the agenda give the impression that investment in many important areas is on the decline. Collaboration between different RDI operators, different process industry branches, and with operators outside the process industry is negligible. This is the case despite the fact that there are major profits to be made by utilising the solutions of other industries for industrial process automation. There are far too few activities that take a holistic approach and that can bring together various interest groups and categories within the industry.

Sweden has a tradition of collaboration between different operators in order to achieve success in the global market. Now there is a new opportunity in the area of industrial process automation to take this Swedish speciality of collaboration to new heights by creating new types of organised interactions between the process industry, its supplier companies and research organisations. If this is not undertaken there is a risk that the attraction in the area diminishes and fewer talented people enter the area. The collective expertise within the country could also decline and fewer activities, initiatives and resources will mean that there will not be enough projects for the operators that we want in the area.

All in all, this means that Sweden must work together and pool far greater resources than was previously the case if it wants to maintain and strengthen its position among both users and suppliers.

Consequently, we are proposing an agenda where we:

1. Establish an Industrial national leadership and a national collaboration platform for the area.
2. Coordinate projects and networking activities with university and college based RDI environments that are identified as particularly strong and relevant to the area.
3. Coordinate and implement combined skills development initiatives with both business community and research partners.
4. Make substantial investments in National RDI programs in this area.

To make a difference in the long term and fulfil the vision of the agenda is of key importance to the implementation of a major investment in national RDI programs. The investments that are based on assessments made within the scope of this work involve government investments of about SEK 200 million per year with a corresponding funding amount from industry/the business community. The principles for calculation of investments by industry/the business community should follow the agreed principles of the FFI (Strategic Vehicle Research and Innovation).

With an investment and financial cooperation (government-business community) of this size, we see great opportunities for the realisation of a formulated vision, and make a substantial difference to Sweden and the affected companies and industries. This is an investment that will significantly contribute to raising the pace of innovation in the area.

Attract future talent

1 INTRODUCTION

1.1 *Process industry's key role*

The process industry is sometimes taken for granted as an obvious economic engine for our country. Despite claims that the process industry is losing its role in favour of other industries, statistics show that industrial companies still represent a cornerstone of the Swedish economy.

Today, a quarter of a million people work in the Swedish process industry. In addition, jobs are created indirectly at suppliers, equipment manufacturers, consultants, services and other sectors. If we expand the concept to the industry as a whole, there are over 700,000 people employed in the industry in Sweden. If we include subcontracting of various kinds, there are about 1.5 million people directly employed at industrial companies or in companies that rely on a strong industrial sector.

Studies show that you can refer to a factor of two for indirect jobs, which means that the sector indirectly employs around half a million people. In some cases, the term factor of four is used to illustrate the industry's importance. One example is Kiruna where about 40 percent of the population depend on LKAB's operations.

Industry and industry-related services in Sweden today account for over 27 percent of GDP, which is more than the figure forty years ago. When the production value of industrial companies is added together with automation company production values, the sum is nearly SEK 1,000 billion. During the boom in the early 2000's, about 50 percent of the growth is estimated to have come from increases in production in industry.

Today the world is in on the threshold of a major industrial leap. An increasing number of developing countries are in the process of being industrialised, and they do so by purchasing the latest technology. Here it is up to the Swedish companies to defend their positions through improved knowledge, skills, technology and product development. The Swedish process industry is continuously focusing on skills and investment in order to enhance the level of automation in its facilities to ensure competitiveness can be maintained. Before the financial crisis of 2008, process industry accounted for as much as 65 percent of total industrial investments in Sweden.

The Swedish process industry represents 13 percent of the nation's GDP and 25 percent of business investment. The process industry is heavily export oriented and adds large net sums to Swedish national households as it largely uses domestic raw materials.

The process industry accounts for:

- 30 percent of Sweden's total exports
- 43 percent of goods exports
- 60 percent of Sweden's total net export income
- 15.5 percent of the business community's industry production value.

(Sources: IVA and SKGS)

1.2 *Pooling resources and interacting. A Swedish speciality*

Sweden has a tradition of close collaboration between researchers, the business community and government. Several of the best-selling export products are the results of R&D collaborations between state-run companies and agencies and large private manufacturing companies. Within the telecom, railway, energy and defence sectors alone Sweden has held an unusually strong position internationally. The common denominator in many of the export successes is precisely because they have been the result of close cooperation between government-research-business community. This collaboration has yielded world-leading products that have greatly contributed to robust growth as the basis of our position as one of the leading welfare states in the world.

Internationally, there are many fine examples of successful business and development collaborations between business partners where partners from Sweden have participated. Several of the major world leading products on the market are, in one way or another, the result of a collaboration of this kind.

It is in light of this history of "cooperation spirit" that many regional initiatives have emerged to create projects in which different operators have been brought together by a common objective of developing new solutions. Initiatives that generate more successful business and development partnerships between different partners by building RDI projects where the needs of the process industry are satisfied by new solutions that can be provided by, for example, various automation suppliers, both from large as well as small and medium-sized companies.

In many contexts, this is showcased as a Swedish model that we in Sweden can develop so that, in a range of collaborative projects, we develop new solutions, which in turn leads to more innovations, new business opportunities, greater productivity and improved efficiency. This means greater competitiveness for everyone involved in the collaboration.

1.3 *Process industry suppliers are increasing*

A globalised world means fierce competition but also great opportunities for competitive operators. If the Swedish process industry is to cope with the challenges, resource utilisation and availability must improve, facilities must be developed and the degree of automation increased. Competitiveness that also puts demands on Swedish suppliers that are part of a supplier industry that provides world-leading equipment, machinery, components, subsystems, solutions for efficient production processes where quality, productivity, environmental management and human interaction are at the heart. Areas in which Swedish industry and Swedish universities and colleges today hold a world-leading position.

The Swedish automation industry and engineering industry are two of our most important industries. The engineering industry has annual sales of around SEK 97 billion. Automation industry sales total SEK 50 billion annually, of which about two-thirds is generated in Mälardalen. The annual export of automation services is estimated at over SEK 12 billion and some 25,000 people work in the industry. Around ten percent of the world's automation industry is located in Sweden, according to a report from Automation Region.

It is largely thanks to Swedish automation expertise that Swedish industry has achieved competitive productivity and quality.

The analyst company Kontigo has identified some 3,900 companies operating in Sweden that work as subcontractors to the process industry. These are companies in the sectors of mechanical engineering, electronics, IT consultancy firms and engineering consultants (groupings according to SNI-standard). Looking at the whole supply chain and including machine manufacturers, engineering companies and computer consultants, we are talking about sales of around SEK 200 billion annually.

If we look globally and at the market growth that is expected, major opportunities for the automation industry will open up. A EU report estimates the global market for automation solutions (monitoring and control) at nearly EUR 188 billion for 2007. The same report estimates that in 2012 the market will hit EUR 278 billion. A market where the world-leading Swedish automation industry has great potential to assert itself.

1.4 *Industrial process automation*

For the process industry, it is not just about having machinery and automation investments in order to achieve greater competitiveness. An important issue is how best you use and develop your production systems.

The production system is therefore not only about technology, machinery and its performance and flexibility. It is just as much about how people integrate into the system, the work approaches and methods adopted, and the change and improvement culture that will serve as a platform for the development of products and production.

In this agenda, we use the concept of Industrial Process Automation to highlight an extremely strategic and potential research, development and innovation area that is of the utmost importance for a number of sectors in the Swedish

»By considering production as an aspect of the process industry's operations the production area can accommodate a number of traditional management areas such as production technology, logistics, maintenance, production economics, material and production control, work organisation and work environment.«

See reference in Appendix 4.

and international business community. And also for mankind's overall ability to handle some of the most critical global challenges that we are facing.

For process industry companies, RDI in the area must particularly help to strengthen facility efficiency, flexibility and safety, but also to lessen the environmental impacts, ensure more efficient product development and stronger customer offerings. These are all factors that are vital for the competitiveness of the process industry and its ability to meet the global challenges in terms of considerations to climate, the environment, energy and long-term sustainable raw material extraction that the modern process industry is facing today. By considering production as an aspect of the process industry's operations the production area can accommodate a number of traditional management areas such as production technology, logistics, maintenance, production economics, material and production control, work organisation and work environment.

The development of automation solutions for the process industry, namely industrial process automation solutions, is the core business for supplier companies in a number of sectors associated with the process industry. These include automation companies, system providers, component suppliers, machinery suppliers, integrators, designers and others. Based on their technology and application expertise, along with a wealth of experience in a range of RDI projects with their customers, supply companies develop their industrial process automation solutions, which can then be key components in product development, streamlining facilities or enhancing customer offerings in the process industry.

What the area covers can be described based on the International Society of Automation's definition of the functional hierarchies in a manufacturing process

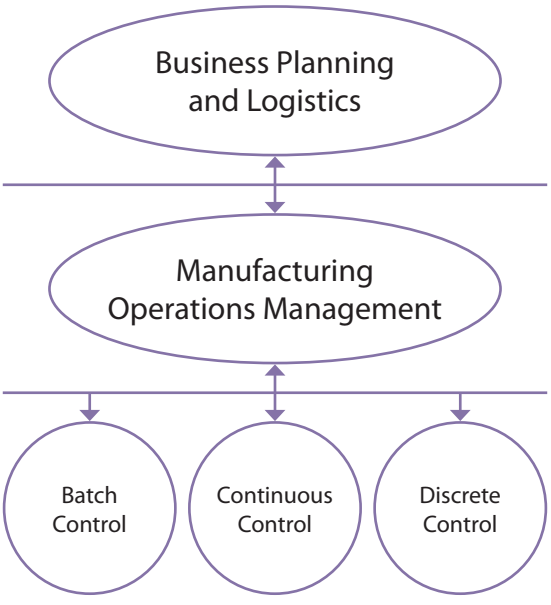

Figure 1 – ISA's (International Society of Automation) definition in ISA 95 of the functional hierarchies in a manufacturing process.

Collaborate seamlessly

2 VISION FOR THE POOLING OF RESOURCES IN INDUSTRIAL PROCESS AUTOMATION

The process industry is important for Sweden, which also has several world-leading automation and machine suppliers. In view of the great global challenges facing us in the form of, among other things, increased competition and new operators, the importance of and opportunities related to industrial process automation is set to increase. Suppliers who are in the area are facing great growth opportunities as the market is predicted to grow substantially.

This is our vision:

> *In 2025, Sweden is the leader in industrial process automation. This is achieved through a number of major RDI-investments with very strong university and college-RDI environments where the interaction between skills and innovation operators has been effective and reciprocal. Skills development activities together with both business community and research partners have been extensive.*

In order to ensure Sweden holds the leading position in the area requires RDI investments that allow supplier companies to be knowledge leaders in selected areas of technology and management areas and process industrial companies using and developing their production systems in an optimal way. All in all, by maintaining and further developing its expertise in industrial process automation.

The relatively strong innovation dynamic that is already present within the country will be insufficient to meet future needs. Consequently, this calls for future innovation system initiatives.

A position that means in 2025 we must have:

- Developed innovation and learning environments that have attracted many talents and continue to attract future talent.
- A number of collective activities that have contributed greatly to the increase of competitiveness for participating industries. And where products and services from suppliers active in Sweden capture international market share.
- Identified strong challenges where operators from a wide range of industries and sectors together have invested and are investing in key challenge-driven R&D activities.
- Established several key interactive projects, seamless between a wide variety of industries, areas and sectors.
- Implemented robust RDI activities that have formed entirely new working methods and tools that are used by the companies' employees.
- Ensured that universities, colleges and businesses, together operate in and develop national RDI environments with long-term strength and attractiveness.
- Established a national innovation and learning culture that allows the business community in the area to increase its competitiveness.
- Developed forms and knowledge for effective innovation processes that have resulted in an enhanced capacity for innovation in the process industry and its supplier companies.

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Prepare employees to handle new working methods and new tools

3 OPPORTUNITIES AND SUCCESS FACTORS FOR THE POOLING OF RESOURCES

Pooling of resources is very much about taking the Swedish speciality of collaboration to greater heights by creating new types of interaction between the Swedish process industry, its supplier companies, and the relevant research and educational institutions. But it is also about enhancing visibility and position for their common challenges in the domestic and European innovation systems. The potential that a successful pooling of resources has for the process industry are effects such as:

- Increased process efficiency.
- Lower capital tie-up and quicker return on investment.
- More efficient logistics.
- More stable skills provision.
- Greater production flexibility and availability.

This pooling of resources for supplier companies means effects such as:

- More efficient product development.
- Increased capital access for early innovation projects.
- More demanding local market.
- Greater access to reference customers.
- More efficient sales and distribution methods.
- Strong recruitment base.

The pooling of resources aims to strengthen the competitiveness and attractiveness of all operators. To achieve the industry effects that the pooling of resources is designed for requires a coordinated effort within and between industries, and an external effort in the form of the integration of industries in universities, colleges, institutes and the larger innovation systems.

Three elements have been identified for the pooling of resources:

1. **More effective and wider corporate partnerships**. This is achieved by the process industry and its supplier companies being brought together to interact within and across industry boundaries, across value chains and in the context of various business and industry-specific collaborations in industry clusters, technology clusters and industrial associations, and more.
2. **Stronger integration with the university and college world**. New forms and structures need to develop to ensure that businesses, universities, colleges and institutes have a significantly higher presence in each other's activities. And that they consequently have a more in-depth, shared understanding of the problems that need solving.
3. **Enhanced role and position in the domestic and European innovation systems**. Industries, universities and colleges must work together to ensure a stronger role and a larger presence in the national and European innovation systems. This is necessary to secure the large RDI resources required to meet increasingly globalised competition.

More effective and more extensive corporate partnerships have an overarching goal of creating a stronger business and cooperation climate between business partners, thereby strengthening the common reception ability of new competitive innovations (both incremental and radical) that strengthen the competitiveness of the companies.

Today there are activities for more effective corporate partnerships primarily through a range of industry associations such as industry clusters and professional associations. You coordinate and communicate activities between different parties to ensure that needs can be met so that knowledge can be quickly transferred from one party to another. Through SMIFU (Smart Mine into the Future), for example, Swedish and foreign mining companies have started working together to

quickly and more efficiently than before identify the challenges and possible solutions that the mining industry jointly face. The forest technology cluster includes companies in the forestry sector that have begun to work together in a similar way which includes initiating joint RDI projects, influencing regional and national innovation systems to better cater to their own industry's challenges, and creating financing of needs driven RDI collaborations.

The pooling of resources proposed here is intended to establish corporate partnerships more effectively by generating the conditions and driving the collaborations from a high industry and company-wide level. A pooling of resources that can generate significant time and quality gains for the operators involved, especially based on their individual commercially based incentives. A successful business interaction produces effects such as:

- Multiple business opportunities can be identified and deals struck.
- The number of joint development projects can get started (for example, that the process industry and supplier companies together identify projects with potential for both parties).
- That there is a higher quality to the development projects initiated (through several operators coming together to identify future challenges).
- That industry operators together, across industry boundaries, can identify and prioritise the most significant problems and improvement opportunities.
- That supplier companies have better opportunities to develop competitive solutions (through access to the process industry as test environments for development projects).
- That the relevant knowledge is strengthened in both the process industry and supplier companies (through improved knowledge exchange between the two).

Stronger integration with the university and college world means that the process industry and its supplier companies are finding ways of engaging more in the emerging knowledge triangles (research, education and innovation) in the Swedish universities, institutes and college world. Among the forms for this type of integration we have joint RDI projects, collaborations in education programs, companies that provide test environments or extensive needs assessments and more. By strengthening the integration of the university and college based RDI environments we increase the possibility of more easily identifying relevant research groups and education programs related to business challenges, and that which over time will form the long-term support for issues that are part of the basic conditions necessary for both radical innovation and skills provision.

Today, a lot of university, college, and corporate partnerships take place through R&D centres that are focused on the various common areas of development. One intention of this pooling of resources is to build on existing partnerships, but also to develop ways for these partnerships to be more easily established at a national, and in some instances, international level.

This integration with universities and colleges is about increasing the likelihood that the right university and college skills (both from research and from education) are integrated with the commercially motivated RDI activities that have been initiated. But also that the research and education programs that are looking for areas of use find the right business-related RDI challenge.

The process industry and its supplier companies provide successful integration effects such as:

- That more talent from the university and college world becomes interested in business and finds its way to the companies involved.
- That more innovative and, in a number of respects, radical ideas will emerge and evolve in the interface for collaboration.

- That multi-disciplinary research projects are initiated on the basis of the challenges facing the process industry and its supplier companies.

For universities, institutes and colleges, successful integration represents:

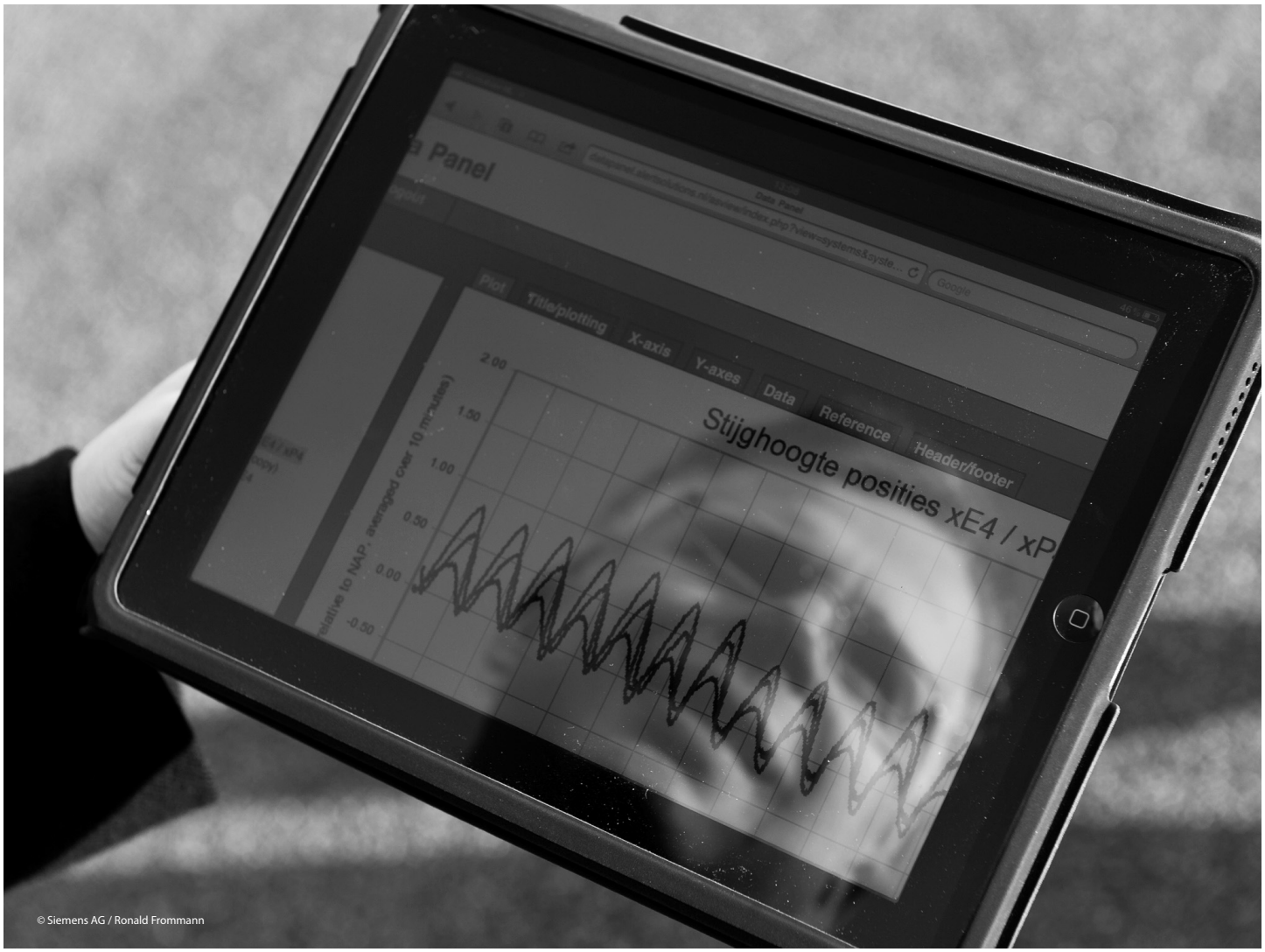
- That students and researchers gain access to dynamic and advanced challenges, as the basis for both education and research activities.
- That disciplines and institutions can initiate strategic research initiatives and educational programs on the basis of the long-term challenges identified in the process industry and its supplier companies.
- That students are given a higher employability factor through their deeper mutual understanding created for the skills and challenges of the parties.
- That companies started by students and researchers who are engaged in partnerships with the business community are given shorter paths when making their first important business deals.

Strengthening the role and position in domestic and European innovation systems is a prerequisite for a business party in a partnership gaining access to the financial resources and individual skills that need to be engaged in order to support its long-term global competitiveness. Among the forms of this positioning we have the reasoning for joint implementation needs and skills audits, and the need to highlight the challenges and opportunities facing individual areas. That challenges for companies can be given more attention in the innovation systems which is important in attracting the resources needed to realise radical innovations. Today there are activities for positioning within innovation systems that are primarily based on specific industry perspectives. Choosing a more open outlook instead will improve the opportunities of identifying completely new approaches to take on the major challenges that today's process industry is facing.

A strengthened role and position in these innovation systems produces effects such as:

- That more public RDI funds will be directed to research and knowledge areas with a high relevance to the process industry and its supplier companies.
- That more industry funds are channelled to RDI projects with a high relevance to the process industry and its supplier companies.
- That private RDI financiers and venture capitalists are made aware of the opportunities that exist within the process industry and its supplier companies.
- That more students and researchers, as well as supply companies, get involved in the challenges that exist within the process industry with respect to their long-term competitiveness.

Sweden can significantly improve the conditions to retain and further develop a long-term competitive process industry sector with the associated supplier sector. This can be achieved by creating and coordinating a national pooling of resources for the Swedish process industry and its supplier companies where effective business interactions, strong university and college integration and a strengthening of the role and position in innovation systems are included. At the same time as this, the prospects for creating a more attractive and competitive knowledge triangle at Swedish universities, institutes and colleges is enhanced.



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Invest in challenge-driven research and development

4 GREAT POTENTIAL FOR SWEDISH INDUSTRY

In work meetings, interviews, studies and investigations, a number of challenges have been identified that the process industry, its suppliers and RDI operators are facing. This mapping also included questions about how a pooling of resources would improve the ability to satisfy these successfully.

For the process industries, the means to cope with challenges can be outlined in general in the ability to develop facilities and processes that can meet emerging environmental and profitability requirements in an increasingly globalised competitive environment.

For supplier companies, the means to meet the challenges can be summarised in the ability to develop solutions over an ever-shorter time frame that meet the needs of the process industry, and to achieve this based on the technologies and knowledge of business processes that are being implemented at an increasingly rapid pace.

For universities and colleges, this concerns the challenges of generating research, education and innovation environments at an increasingly higher rate that can attract and bring together both students and researchers, as well as companies and financiers.

The pooling of resources is designed to identify forms that can get these three interest groups to vigorously engage in, and appreciate the value of, tackling the challenges they face together.

4.1. Increased competitiveness in the process industry

The process industry needs to constantly enhance the competitiveness of its facilities and products. This means, among other things, becoming more efficient in the various processes, increasing availability, improving quality and increasing the use of raw materials and reducing environmental impacts. Being competitive also include aspects of health, environment, safety and work quality.

In order to remain competitive on a global scale, the majority of industrial process sectors is increasingly migrating from producing traditional bulk products to an ever-more specialised production of niche products. Success is based in many cases on close cooperation and an intimate dialogue with customers. The business model is based on the strategic analysis of customer challenges in order to focus internal product development on meeting the future needs of customers. Many Swedish companies from several sectors are considered as market-leading suppliers from an international perspective. This success model increases the complexity of corporate management through an increasing need for switching production between different product qualities to satisfy market demands for high quality niche products. More industrial process automation, including new innovations, investments in skills development and where management of the business has greater opportunities, all presents huge potential for more efficient conversion of production procedures and thereby more flexible production facilities.

At the same time the production capacity in many facilities can also improve without major capital-intensive investments. This essentially means that there is huge potential to further optimise facility utilisation.

Increased utilisation of industrial process automation will contribute to individual process steps as well as all the facilities being utilised to the maximum. The sum of all this contributes directly to enhancing competitiveness.

Challenges that the Swedish process industry is facing and where the industrial process automation is a key area in order to satisfy these include:

1. Production facilities capable of manufacturing niche products and adjusting rapidly and where production is increasingly governed by the principle "on order" with many manufacturing facilities that are today designed for continuous production for inventory.
2. Facilities that move from having underused capacity to being more efficient with better tools and production planning.

This means:

– Resources, methods and skills to analyse and approach the potential production capacity of the facilities.
– More integrated development and design of production processes in which skills from different disciplines interact considerably better. Skills in operations, maintenance, management and automation together with facility and process design.
– Increasing the utilisation rate of investment through an organisation that, among other things, can work to continuously adapt the facility to ensure optimal delivery efficiency. This covers the effectiveness in the different developmental stages during the life cycle of a facility/facility component.
– Working with better and safer interaction between personnel and systems.

3. An ability to meet and adapt to the challenging and growing demands of society:

– A production chain with reduced environmental impact, reduced energy use, including reduced dependence on oil.
– Good and ethically defensible access to, and efficient utilisation of, raw materials with more recycling and better use of residual material.

The process industry also needs to continuously develop its products and offerings to meet the new and future requirements of its customers. Even here, the pooling of resources has great potential to contribute to the checking, control, monitoring and collaboration as different professional categories are becoming increasingly more complicated to manage. In this context there is a need for solutions that allow:

- More stable product quality, lower degree of rejection and tighter tolerances.
- Better and more efficient production planning, logistics and transport.
- The development and refinement of new processes and procedures to both develop and produce new products.
- Better understanding of customer requirements and processes and how individual products affect processes and profitability.
- Better ways of monitoring and collecting production and product data throughout the production process, during transport and handling at the customer's facility.
- More efficient product development through the interaction of several areas of skills.

4.2. *Increased competitiveness for suppliers to the process industry*

If both our existing and new industrial process automation suppliers are to remain or become the leader in this area, new products and services must be constantly developed. This is based both on new technologies and innovations as well as open and usable systems where the requirements and expectations of users are always increasing.

Advanced automation solutions are essentially based on complex relationships and theories, while the increasing availability of data and information has led to today's process operators and production staff in many cases, experiencing a wealth of information that complicates the process of technical decisions. Simulation and visualisation offers a powerful way of raising the level of process technical knowledge. By assuming that humans are integral parts of the systems, their usability can significantly improve despite its high complexity. Providing these systems, methods and tools are examples of the expectations that suppliers must meet. It is these challenges that Swedish process industry suppliers, among others, are facing.

4.2.1 With new technologies and innovations meet the challenges facing the process industry

- Through an increasing ability to protect interests in consumers, the Internet, gaming and media technology without reducing the demands on robustness, availability, durability, etc., provide new and better customer value in its products.
- The rate of retirements is great and a new generation of young operators and users are likely to set higher standards on the industrial systems resembling many of the consumer products they have grown up with such as Facebook, Windows, Google, Apps, Blogs and more.
- New technologies and new innovations will make it possible to meet future customer requirements in, for example, new industrial processes, new logistics, new ways of working, improved maintenance or new information needs where technology and innovation are the key facilitators.
- Make it considerably easier to integrate new solutions into its facilities and logistics along with old solutions by providing methods and tools for the easy migration from old to new technologies over time.
- Emerging technologies include, for example "Internet of things," System of systems, Service oriented architecture, Built-in electronics and wireless technologies.

4.2.2 With significant function enhancements, usability and transparency

- Methods and tools that support verification, training, tests and operation through the life cycle of a facility. From the planning of the facility or facility component until it is phased out or completely redesigned.
- The lack of common standards for system integration inhibits information exchange and integration across, and within, different facilities, between different categories of staff and between systems, both our own (business, production, maintenance, control, and logistics) and with the systems of others. Increasing ability to exchange information through common standards and common technology platforms, for example, is an essential requirement.
- Increased information exchange and increased information content leads to demands for improved business and production overviews and tools for production, maintenance and logistics planning and operations.
- The ability of suppliers to manage the complexity of their own products in relation to an ever growing process and facility complexity at customers must improve.
- Systems for both personal and equipment safety at facilities. The requirements for increased functionality and integration in an increasing number of applications are on the rise.
- Communication systems and associated infrastructure will be facing increasing demands and more users, while performance and availability is expected to improve. Interoperability between systems and different system solutions is expected to work with a minimal amount of configuration input.
- In general, automation and IT solutions are expected to require reduced design input, upgrade costs and system maintenance, while usability needs to be improved significantly. It is also expected that more self-configuring, self-calibrating and self-sustaining systems and solutions will see the light of day.

4.2.3 With improved service content

For suppliers, both new and existing, there are great opportunities to increase the content in what they deliver. According to a EU study on "Monitoring and Control" it is expected that it is these services that will have the greatest growth potential in the future. Here it is important to know your customers, market, subcontractors or partners. At the same time, you need to better utilise new technology opportunities in both development and delivery as well as the aftermarket, distribution, and in getting paid. There is great growth potential in:

- New and other business commitments. Delivering more content and more services in solutions where, for example, business undertakings may mean that the supplier gets paid in line with production targets and facility availability instead of the traditional business commitments related to product shipments.
- An opportunity for smaller suppliers is to improve the ability of tying in several subcontractors in order to take on greater commitments and increase supply capacity.
- If suppliers are to expand their service content, this will call for improved knowledge about the processes of their customers as well as knowledge on how their facilities can be more efficient. With improved process understanding, and with the tools for this, suppliers can increase their capacity to formulate strategic business proposals that are linked to different production targets.

4.3 Skills development

Growing competition has forced cost reductions in the industrial process sector, which among other things, has come in the form of staff reduction. This has meant that many industries today lack indepth expertise in industrial process automation. Industrial process automation is essential, a core competency of the industry to ensure high production efficiency and profitable production of high quality products, and consequently a prerequisite for the competitiveness of the process industry. In recent decades, many innovations have been developed in the area of automation that industry has found it difficult to absorb because it often lacks adequate procurement skills or resources.

It is therefore of paramount importance to have skills development initiatives. One way for the industry to become more effective and add more content is to share and coordinate these initiatives. This is of the utmost importance both for the process industry and supplier companies. For the process industry, this is about having enough industrial process automation expertise to identify, assess, and implement powerful solutions. For supplier companies, it concerns both technological expertise and knowledge of process industrial processes, facilities and products.

Strong joint and coordinated efforts in skills provision and development meet the challenges such as:

- The need to better utilise human resources and develop staff skills.
- Ability to cope with the large number of retirements facing the industry.
- Improved ability of staff to utilise the most appropriate and "latest" technology and assimilate the innovations and the knowledge that emerges from various RDI environments.
- The ability to create a positive image of the profession in young people thereby ensuring long-term skills provision and interest in automation issues. "Recognise industrial process automation as a profession."
- Ensure that the Swedish process industry has adequate and a high level of and purchasing skills. For example, through targeted training initiatives.
- Strategic work to reduce the skill gaps between the supply chain and industry.

4.4 *Strong partnerships*

To further develop the strong position held by Sweden and the companies involved requires additional investments in the area that an innovation system operates in. That is, focusing on how well the operators involved can work together on everything from research and product and business development to commercialisation and industry development. The increased interaction between RDI operators has great potential to meet all industry challenges in a better way, for example, by developing solutions faster and with greater precision based directly on the clearly defined needs of the process industry.

In the area of industrial process automation, it has also been very evident that skills provision and development at both the process industry and its suppliers is a major concern. The potential here is also more intelligent collaboration in particular.

This concerns creating an enhanced innovation and development dynamic through:

- Creating industry and sectors RDI projects that open up powerful and common projects and project portfolios.
- Developing industry clusters and development projects, with a clear business focus, in technical areas that are important areas in the future where Sweden with its various strengths and relevant areas of knowledge can make a difference to its industry and attain a world-leading position.
- Creating additional and more efficient resources for RDI.
- Strengthening the SME's development capacity by enabling them to enter strong RDI environments, establishing relationships with major international operators, and building up good relationships with potential customers who might be good references.
- Larger operators can create synergies with innovative, fast and technologically advanced SME's and use them as subcontractors. Smaller suppliers also have this ability to learn new skills, who would otherwise find it difficult to attain them, but that they can achieve here through a partnership.
- Strengthening the capacity and scope for greater co-operation activities and projects with end users, suppliers and R&D operators in RDI environments.
- Increased personal and skills mobility within and between RDI operators.

Strengthen long-term future environments

5 NATIONAL POOLING OF RESOURCES – ACTIONS AND PROPOSALS

5.1 *Summary*

The national pooling of resources can be summarised in five actions. Two of the actions are to establish more effective and broader corporate partnerships. Furthermore, two additional actions are designed to create stronger integration with the university and college world as well as a comprehensive action to strengthen the area's role and position in domestic and international innovation systems.

The pooling of resources for industrial process automation is based on operators in the industry driving and investing vigorously and where national RDI financiers contribute with the same robust program investments. The pooling of resources is based on the challenges and opportunities identified for the area and for its operators, while it must utilise the very important and existing areas of strength with development and growth potential.

More effective and broader corporate partnerships:

1. Establish an **Industrial national leadership** and a **national collaboration platform** for the area.

Stronger integration with the university and college world. The missions of leadership and the platform are to:

2. Coordinate **projects and networking activities with university and college based RDI environments** that are identified as particularly strong and relevant to the area.
3. **Coordinate and implement combined skills development initiatives** with both business community, university and college partners.

Strengthen the area's role and position in national and international innovation systems:

4. Substantial investments in **National RDI programs** in this area. Efforts should be of the order of SEK 200 million per year over a 10-year period, and be funded at a corresponding amount by the affected businesses.

In order to strengthen the area's role and position internationally, the established leadership and platform will simultaneously push the argument and lobby for the region's importance in relation to international RDI financiers as well.

5.2 *Establish an industrial national leadership and a national collaboration platform for industrial process automation*

To clarify the importance of the area and ensure its long-term legitimacy, it is vital that the leading process and supplier companies join together and create common industry-based leadership for the area. This leadership will have overall responsibility for the area's national agenda, and ensure that the framework conditions such as the research and education policy is influenced in a direction that is important for the area.

The leadership must also ensure that the area has a well-functioning collaboration platform that can operate and develop sound business partnerships, and also work towards generating useful and effective links with the relevant RDI environments and RDI organisations. The leadership must also position the area as strategically important in order to strengthen Sweden's competitiveness.

The leadership will be comprised of senior executives in the Swedish process industry and its supplier companies.

In real terms for leadership this means:

- An agreement is in place that regulates how the organisation for the collaboration platform is managed.
- The collaboration platform's Board of directors is industry-dominated with representation from the process industry and its suppliers, including from SMEs. Relevant research and innovation operators are also represented. The representation must reflect different parts of Sweden and various process industry sectors.
- More than 30 major industry operators sign the agreement which is statement of support for the organisation.
- The Board:
  - Appoints the executive management and related functions
  - Determines the assessment criteria for RDI projects in consultation with the financiers.
  - Determines the priority for RDI projects to financiers.

This collaboration platform will consist of an organisation with a number of businesses, business clusters, industry associations, innovation networks and RDI operators in different configurations which together:

- Initiate and drive powerful collaborative projects (both with commercial and RDI targets).
- Drive and support the relevant networks, arenas and meeting places.
- Initiate and coordinate skill development initiatives.

One aim of the collaboration platform is that the constituent operators together become more efficient in the initiation and establishment of various types of collaboration, and enjoy a better position for raising the quality and effectiveness of the activities that they together and separately, drive on.

Furthermore, the collaboration platform will gather and disseminate appropriate needs scenarios from the industry, maintain a more general presentation of what the current situation is in the area, and together with other operators describe future key initiatives and areas and describe the kind of operator working in these areas, be responsible for a continuous update of the area's agenda and technology road-maps, and more.

Key functions in the organisation of the platform will be networking, coordinating the partnerships, project construction, concept incubation, initiating and driving new strategic partnerships, benchmarking and more.

The platform is also planned to serve as a national node for a collaboration with Finland for joint projects, initiatives and in order for Swedish operators to be able to drive critical issues in the area with Finnish operators on important and relevant programs, organisations and platforms in the EU. The ProcessIT.EU organisation headed by Sweden and Finland, which is a certified Centre of Innovation Excellence within the European Technology Platform for Embedded Systems, provides countries with an excellent base from which to drive issues in "Automation for Process Industries" in the EU.

The platform will consist of relevant companies or corporate clusters, trade associations innovation networks and RDI operators and regards its primary mission to support the skills and RDI activities of their individual stakeholders in the area.

Examples of a few relevant operators include Automation Region, ProcessIT Innovations PICLI, PIC-LU, SICS, The Paper Province, FindIT, Svensk Automation, and ITF.

In real terms for the collaboration platform this means:

- The collaboration platform has a stable form of organisation and its own CEO.
- The organisation has a number of employees who are also responsible for six focus areas.
- An RDI council is linked to the organisation with representation from the partners who signed the participation agreement.
- The organisation
  - Appoints grouping from partners and stakeholders for various studies, etc.
  - Produces supporting documentation for all announcements made by financiers.
  - Assesses and evaluates projects based on agreed criteria.

5.3 *Strengthened RDI coordination in relation to national RDI environments*

This coordination is about identifying leading and relevant RDI environments and research groups that can strengthen the area's strategic projects and networks, while increasing the attractiveness of these RDI environments to companies, researchers and students both nationally and internationally.

The aim is to lay the foundations for achieving more competitive projects and networks in the area, while contributing to the quality and attractiveness of the identified RDI environments. Effective interaction between the business community and these environments should be the best way, both in the short and long term, of contributing to the development of new and more competitive solutions, knowledge and expertise in the area.

The coordination will consist in:

- Establishing close cooperation with national universities and colleges.
- That research and education activities at universities and colleges open up to the process industry and its supplier companies in a better way.
- That the area's businesses and industrial companies are opened up to researchers and students.
- That developed laboratories, testing environments and clusters both in the business community and academia are strengthened, and above all are made available in a completely different way to both parties.

Among the relevant operators there are research groups at universities and colleges that in the current situation work with identified clusters, associations and innovation networks.

In real terms this means:

- The collaboration platform maintains a map showing how the different environments work in various focus areas and the activities available there.
- The organisation's website for RDI environments that are participating are presented as operators in the area.
- RDI operators have evolved into being stronger and more focused in their specific areas.
- The organisation works actively with cluster proposals and operators in projects with more consideration taken to the big picture.

5.4 *Coordinate and implement skills development activities*

To meet the long-term and pronounced skills provision needs of the companies, it is vital in this pooling of resources to develop nationally coordinated skills development activities. These activities are also important in strengthening the process industry and its supplier companies both in the short and long term in their ability to absorb and develop competitive solutions and are implemented in close collaboration with universities and colleges that are also major opportunities for these initiatives to contribute to the further development of university and college research, education and innovation environments.

Among the key objectives of these initiatives are:

- Increased automation and technical expertise among key people in the process industry.
  - Through specific technical and automation solution courses.
  - In general, more general business and operations-related industrial process automation and process development courses.
  - Through companies acting as host organisations for trainees, thesis students, etc.
- Higher technology, process and business expertise in automation and supplier companies.
  - Through technology-specific courses.
  - Through more extensive business and operations-oriented courses.
  - Through trainees, thesis students, and others who may be given assignments in the process industry.
- More in-depth understanding in the process industry among students and researchers:
  - Through trainee, thesis students, summer workers, industrial doctoral students and traineeships.
  - Through seminars and university and college visits from the process industry.
  - Through wider use of social media in the process industry.
- More attractive and industry-related RDI environments at universities and colleges.
  - Through the involvement of more professionals/trainees in training.
  - By allowing students to work with more dynamic cases.
  - Through teachers being able to develop better application and professional expertise.

Among general activities the following can be mentioned:

1. Skills needs analyses. To better identify the specific needs for skills of organisations and sectors and thereby be able to develop better proposals for needs-driven skills development initiatives.
2. Skills development activities. To meet the identified needs, typically in the form of courses and contract training courses, as well as seminars, workshops and lectures.
3. Structured university, college and business exchanges. These could consist of students and teachers during the course project being out on different types of training activities, but also in companies that give guest lectures or provide efficient and live practical cases.

For the process industry, skills development activities involve the provision of key employees with better management, process and automation expertise, both in order to advance themselves in specific management and technical areas, and to be better purchasers and providers.

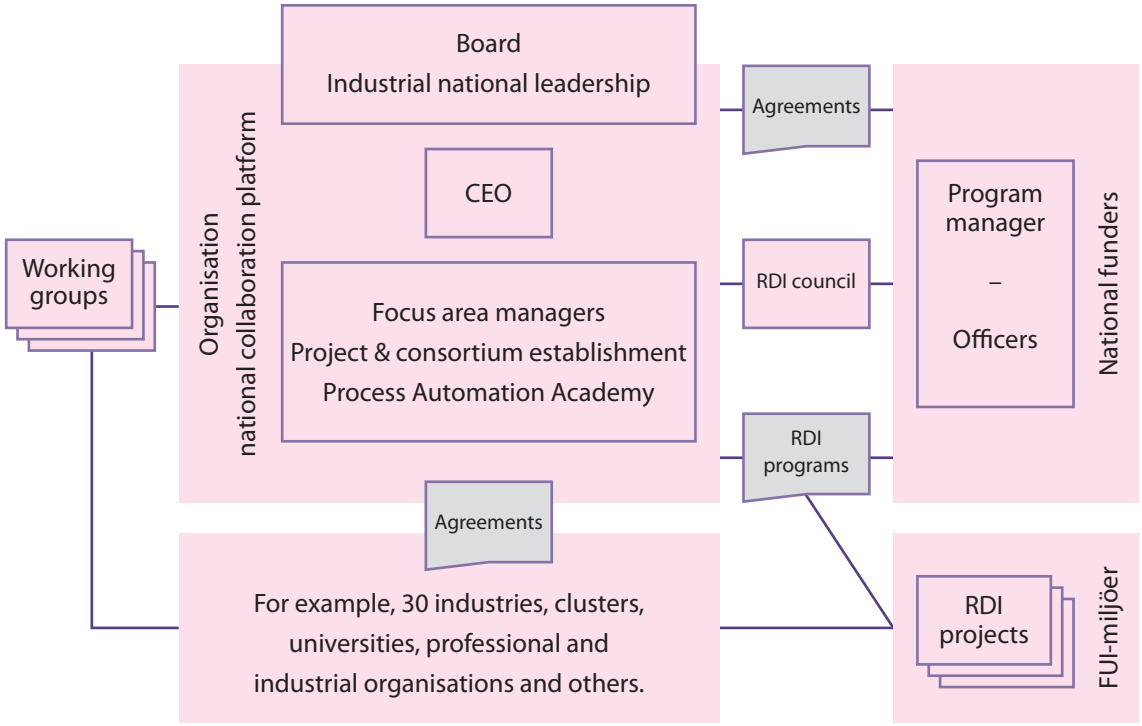
For automation and supplier companies, the activities are about providing them with a deeper understanding of the conditions and challenges facing the process industry, but also an opportunity to advance their knowledge in specific areas of technology.

For students, researchers and teachers at universities and colleges, the activities are about providing them with a deeper understanding of the conditions and challenges facing the process industry. But also providing them with in-depth knowledge in specific process and automation challenges.

The target group is the process industry, supplier companies, universities, colleges, and specific education and training providers.

In real terms this means:

- The collaboration platform provides an annually updated directory of all skills development activities that can be "Purchased/Used." In particular, based on the needs of the process industry but also open to other industries, universities, colleges and other relevant entities.
- A council is in place to evaluate where the "skill gaps" are, and assess and propose actions.
- RDI projects that are generated and supported by the collaboration platform always have skill development activities. For example, by increasing the reception capacity of new innovations and solutions.
- National targets are in place for the number of doctors, etc. in the area and for completed training hours That a collaboration platform has contributed to.
- There are announcements for research funds to support various training initiatives.
- Skills development activities are grouped under a common name, organised and headed by the collaboration platform.


Board
Industrial national leadership
CEO
Focus area managers
Project & consortium establishment
Process Automation Academy
Organisation
national collaboration platform
Working groups
Agreements
For example, 30 industries, clusters, universities, professional and industrial organisations and others.
Agreements
RDI council
RDI programs
Program manager
–
Officers
National funders
RDI projects
FUI-miljöer

5.5 *Investments in major national RDI programs*

The above four actions are those that the operators who are behind this agenda will be able to implement and take responsibility for. This investment in major national RDI programs, however, is entirely dependent on the decisions made by national public RDI financiers. Making a difference in the long term and fulfilling the vision of the agenda also calls for a major investment in national RDI programs. The investments that are based on assessments made within the scope of this work involve government investments of about SEK 200 million per year with a corresponding funding amount from industry/business community. With an investment and financial cooperation (government-business community) of this size, we see great opportunities for the realisation of a formulated vision, and make a substantial difference to Sweden and the affected companies and industries. This is an investment that will significantly contribute to raising the pace of innovation in the area. And that with an emphasis on areas higher up in the automation hierarchy where growth is expected to be extra high, this will provide a robust boost to national and industrial growth and competitiveness.

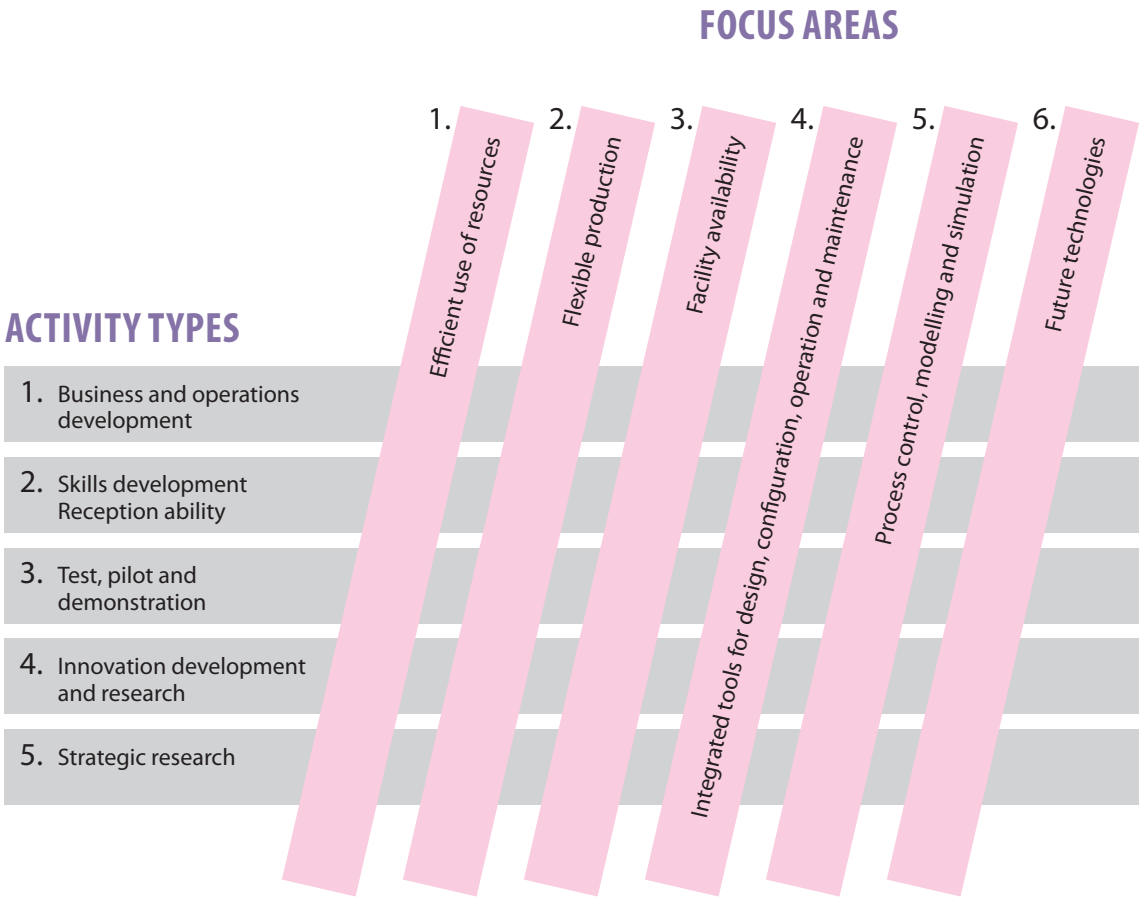
Below are examples of some specific programs.

- Investments in new technology areas with high growth potential in industrial process automation, such as various emerging Internet-based technologies, sensor technologies, real-time simulation, Cloud computing and the new concept of Big data.
- Efforts linked to the process industry's global challenges such as energy efficiency and environmental impacts.
- Focus on projects with a clear peak of innovation and the potential for radical impacts on the entire industrial process automation area. For example, robust industrial platforms based on established and emerging technical platforms and the Lean Automation area.
- Investment in critical but traditional automation areas such as optimisation technology, Information management and processing and the solutions that support greater mobility.

The target group is research and innovation financiers, mainly at a national and international level.

In real terms this means:

- A national RDI program for the area of SEK 200 million from national public financiers and the corresponding amount of SEK 200 million from the industry from 2014. Investment will be escalated from 2012. The program is updated every three years.
- The focus areas that are to be funded are defined with associated actions. See Fig.
- Agreements between financiers such as VINNOVA (Swedish Governmental Agency for Innovation Systems), SSF (Swedish Foundation for Strategic Research), Tillväxtverket (Swedish Agency for Economic and Regional Growth) and Energimyndigheten (Swedish Energy Agency) and the organisation are in place.
- The financiers manage the whole application process and take the ultimate formal decisions based on the organisation's proposals.



Focus areas include:

1. Efficient use of resources
2. Flexible production
3. Facility availability
4. Integrated tools for design, configuration, operation and maintenance
5. Process control, modelling and simulation
6. Future technologies

Activity types that are included in all focus areas are:

1. Business and operations development
2. Skills and reception ability for new innovations and solutions
3. Test, pilot and demonstration
4. Innovation development and research
5. Strategic research

The RDI-funded projects may include all, several or just one type of activity but have different forms of funding. By way of suggestion for AT1 and AT3 30 % public sector and 70 % industry. For AT4 50 % funding from both the public sector and industry. For AT5 70 % public sector and 30% industry. AT2 has 20 % funding mainly to develop the skills development concept, but where the users should bear the full costs of execution.

Focus areas:

1. **Efficient use of resources**
   Refers to projects aimed at more efficient use of resources in the areas of energy, environment, transport and raw material handling. The projects can address issues such as how to plan, model, monitor and control new and existing processes throughout the whole production chain in order to achieve reduced environmental impacts, reduce energy use, and to optimise logistics. This also includes equipment, systems and working procedures for handling raw materials for the whole production chain. From "breaking" to producing, where information is collected early in the chain in order to plan production, meet market needs and control the processes better. Raw material characterisation and systems that support the recovery of raw materials are also included in this focus area.

2. **Flexible production**
   This area primarily relates to projects that, in terms of business planning and production planning, lead to new working methods, tools and systems that improve the ability to adapt to the market and order status, and thereby the ability to manage complex processes and production facilities. In so doing, production and operations can be planned and run by the resources, design, capacity and equipment of the facility. This may contain solutions that provide better information for planning staff, better interaction with information systems and new ways of working which also support a better exchange of experiences. Flexible production with support for new business commitments that also provides more stable product quality, lower rejection levels and that can deal with tighter tolerances. Technically this also refers to systems for integration of multiple systems and information exchange between these systems.

3. **Facility availability**
   Much of this area relates to projects in maintenance and what is known as eMaintenance. Projects can, for example, address enhancements and new solutions for maintenance planning and control based on projections and models that can be used by maintenance systems or other systems at the facility. Technically there may be sensors on the equipment for maintenance, projections or other solutions that enhance the safety of the facility's machinery and equipment. Projects that develop methods and tools for integrated development and design of conversions or new production processes are covered in this area.

4. **Integrated tools for design, configuration, operation and maintenance**
   Projects in the area should develop methods and tools that support verification, training, tests and operation through the life cycle of a facility. Methods and tools that can reduce design efforts, upgrade costs and system maintenance and with considerably better usability levels. Technically, systems and solutions are also included that are self-configuring, self-calibrating and self-sustaining.

5. **Process control, modelling and simulation**
   Applications and systems for measurement, control, monitoring, communication, interaction and training. Systems that also have enhanced robustness, availability, durability and simplified upgradeability. With process models and other dynamic models, different RDI projects can build virtual factories that can be used by simulations for a raft of applications, while providing support for improved process understanding.

6. **Future technologies**
   This refers to the area known as Future Emerging Technologies (FET). An incubator for new ideas and the theme for long-term research in the area of process automation. The objective is to promote long-term research and RDI projects that could potentially lead to breakthroughs with high technological and societal impacts. Other examples are the use of emerging and new technologies used in consumer, Internet, gaming and media products. Internet of things, cloud computing, service-oriented architectures and new networks and communication technologies.

Create sustained competitiveness

6 FROM AGENDA TO ACTION

With more than 30 large process industrial entities and supplier companies and a number of industry associations and networks of innovation behind the agenda, we can see great potential in this pooling of resources that can make a major positive difference to Sweden and the affected companies/sectors. However, when moving from agenda to action we envisage a two-step process. The first step is feasible to implement in the spring of 2012 and aims to develop formal procedures and to implement the proposed actions. The second step involves the implemented pooling of resources, and the long-term operational work that is to be conducted.

Leadership and collaboration platform

In order to establish a leadership structure by the spring of 2012 , the group will serve as a steering committee over the duration of the project to be engaged as an interim solution. Their primary mission is to identify the forms and organisation for leadership and the collaboration platform. For example, forms of membership, cross-platform coordination, accountability, and more. After this has been established, the formal leadership can be elected/appointed using the methods the interim management has determined.

As support, the interim management/steering committee will have an existing project and reference group.

Initially, the trade associations and innovation networks that have been engaged in this pooling of resources will step in to identify and test possible partnerships and synergies. After the organisation and forms for the platform have been established, however, the platform will open up to others, and then gradually begin to involve as many of the organisations as possible that are willing and able to help develop this collaboration platform.

In the spring, the initial operators will commence work on identifying other possible organisations and clusters, in order to use these to describe how their specific focus and missions could be integrated into the larger common collaboration platform. A possible coordination within the collaboration platform could be through one of the involved organisations being authorised as host and convener. However the methods used for this can be investigated in the spring.

The first step from agenda to action means in real terms:

- Current HLG is proposed as the interim board and sets guidelines for what the management team is to implement.
- Pushes for the long-term focus to be in place.
- The activities must be conducted as the first step (see below), headed by people appointed from the current project and the reference group.
- A management team from different parts of Sweden (Processindustriella centrum, ProcessIT, Automation Region).
- An RDI council (The majority of the remainder of the reference group + supplements).
- Responsible for the task force grouping that is appointed.
- Funding for this first step is arranged (SEK 4-5 million).

RDI-coordination of national RDI environments

In the spring, the operators involved in the collaboration platform will be driving forces when building projects, at seminars and workshops, and in different ways examine how these might be implemented in close cooperation with university and college representatives and community operators throughout the

country. Initial investigations can be focused on the comparisons and how investments in RDI environments in other contexts have been successful both in terms of skills and knowledge development, and in respect of regional growth. With representatives for these RDI environments, it is then the case of developing strategies and activities that continue to enhance these environments and their synergies with the collaboration platform and its organisations.

The first step from agenda to action means in real terms:

- Invitation to the RDI environments that have the greatest activity now in the area to appoint a Task Force that provides an excellent overview of what is happening in the focus areas and activities that have been proposed.

Coordination of skills development activities

To initiate this process, the operators in the initial collaboration platform in the spring will set up a team (task force) to formulate and initiate a draft for an "academy" for skills development in the area. The team can carry out an inventory of current projects, needs and supply and on this basis, draw up guidelines for how different coordinated, target-group oriented skills development initiatives can be organised and implemented.

General skills provision is critical to our future competitiveness which is why the national pooling of resources also focuses on increasing the number of candidates for technical training in general. This is a common area of interest for several industries and is an integral part of the national agenda.

The first step from agenda to action means in real terms:

- Describe and collect all relevant ongoing skills development activities.
- Appoint a council representing the ongoing skills development activities.
- Describe the ongoing activities and initiatives in order to increase long-term general skills provision.
- Initially this is grouped under the name Process Automation Academy.

Investments in major national RDI programs

To initiate a dialogue with national RDI financiers concerning this pooling of resources, the leadership and the reference group that have worked on the agenda will have a number of introductory meetings with the relevant financiers in the spring of 2012. These financiers will also be invited to an initial working meeting with representatives from the area and the collaboration platform. During the meeting it is hoped that opportunities and the methods adopted for current and future initiatives and program types of financiers can be identified, and then together describe how these approaches can support the RDI in this area. It should also be stated precisely how these approaches can be influenced and developed to conclusively meet the needs of Sweden's RDI in the area.

The first step from agenda to action means in real terms:

- Letter of intent between the financiers and some of the major industrial companies (at least 6).
- Program managers at the financiers.

Increase the capacity for rapid innovation

Contact information and documents can be downloaded from:

www.processindustriellautomation.se