INNOVATION ACROSS BORDERS
EDITORIAL

ALL GOOD THINGS COME IN THREES” —SO WELCOME TO THIS THIRD ISSUE OF ‘EUREKA – INNOVATION ACROSS BORDERS’ WITH A FOCUS ON MANUFACTURING!

The world becomes smarter and the manufacturing industry is undergoing a profound transformation. Some (our feature writer of the issue being one of the first ones) have called it a revolution. And as with previous industrial revolutions, they are never just about technology but also about policies. In our political interview on pages 6 to 8, Mr Reinhard Butikofer, rapporteur of a report on digitising European industry, raises very important issues. What is very nice to see is that most of these issues are also reflected on the ‘tech side’, for instance ‘security’ (see answers by our Cluster representatives in the upcoming challenges in smart manufacturing’ series on pages 14 to 25) or the ‘digital divide’ (see Euripides MM WIN project on pages 30 to 31).

As industry uses more and more robots (e.g. iVAR project on pages 28 to 29) and jobs previously done by humans get automated (e.g. MEDIATRANSFIL project pages 32 to 33), it is very worthwhile to think about specific human qualities. What would make us so special actually? The main message of our feature story by ‘The new industrial revolution’ author Peter Marsh on pages 12 to 23 might give a hint.

He argues that, after all, mastering technology is never the main driver of success for a manufacturing company. Finding a niche and having a network are far more important. Now, finding a niche requires imagination, one of the things the human brain is unbeatable at (see for instance how our innovation hero Vera Peralta started his company Cluned on pages 34 to 35). And having a network requires being able to maintain strategic relationships with the very human decision-makers in other companies.

This is where EUREKA comes in. All its support instruments are about collaborative projects that bring different actors big and small together, often with complementary skills and customer bases. Such a project can set the basis for building successful business networks, and EUREKA is constantly trying to monitor its impact to design support programmes that meet their needs (see the article on impact assessment on pages 36 to 37).

EUREKA is of course not the only network supporting innovative companies. But with its strategic position between National and EU innovation support, reaching out to international partners across five continents, it is one of the best-connected community-based platforms (see for instance the article on our cooperation with EEN on pages 26 to 27 or the feature story on our FR members on pages 9 to 11).

All good things come in threes, but they don’t end there. This magazine will continue to serve as a platform to exchange knowledge and opinions within the extended EUREKA network. However, after some great years at EUREKA, our editor Thomas Ehritz will soon embark on a new journey. It is yet to be decided who will take over, one thing is already quite certain though — it won’t be a robot. Stay with us and keep on innovating! philippe.vanrie@eurekanetwork.org [Head of Eureka, Corroration/Publisher] thomas.ehritz@eurekanetwork.org [Editor]
What we need is coherent policy-making to avoid segmentation of all the efforts that should be driving the transformation of European industry.

No su country is sufficiently big to stand a good chance at competing at the same level as the best international competitor without integrating into a European digital single market and ensuring the framework conditions apply across the su. Of course, this coherence should be built from the bottom up, but you cannot succeed doing this on a national level only.

RB: You are a representative of the Green Party: in what way is this new industrial revolution an opportunity for industry to become more sustainable?

RB: In general, I would say that an industrial digitisation strategy and an eco-efficiency strategy probably work best if they work hand in hand. There are some good examples — look at the energy market: digitisation helps to create a more effective supply and demand system. Or look at the circular economy: digitisation allows industry to be more efficient in using resources and energy. With the help of digital technology and big data use, countries like the uk and Denmark have created systems for industrial symbiosis, where waste from one industry becomes a secondary resource for another.

RB: To assume that the Parliament, through accepting my report, is favouring a top-down approach would be a misunderstanding. That’s not what we’re looking for.

RB: Are you in favour of taxing robots, an idea that was mentioned in another report by the European Parliament?

RB: I’m not in favour of taxing robots but I’m also not willing to jump to conclusions yet. I think it makes little sense for one sector of industry to put a tax burden on another. But there certainly could be erosion of the traditional tax base and we will have to look into how we can avoid that. I’m not advocating shortcuts, but I am certain we have to look into new options and cannot exclude them completely.

IT IS A POSITIVE POLITICAL SIGNAL THAT THE EU TODAY HAS A COMMISSIONER FOR DIGITISATION”

GERMAN MEP
REINHARD BÜTIKOFER
ON A DIGITISATION STRATEGY FOR EUROPEAN INDUSTRY, OPPORTUNITIES AND CHALLENGES OF THE DIGITAL TRANSFORMATION – AND WHAT POLICYMAKERS SHOULD DO TO FULLY REALISE ITS POTENTIAL.

Interview by Thomas Ehritz. Photo by Walter
Back to your report: it states there is a ‘potential to be unleashed’ in view of the changes in consumer behaviour and choices that digitalisation has brought about. How can this be achieved?

First, I think we must have fair market conditions — because if consumers are exposed to monopolistic or oligopolistic practices, they cannot much benefit from a new technology. Second, SMEs need to be included, and third, we also have to integrate the consumer point of view in the development of new technologies. When we develop new standards in the traditional European industry-led standardisation system, the consumer perspective has always been taken into account. We must make sure that this is the case in the future, when many standards originate in continents where consumer protection is less supported than in Europe. Government institutions have an important role to play as well, as they can be service providers for digital technology, to improve accessibility for people with disabilities, for instance.

What can policymakers do to allow small companies to scale up and become the next generation of big players? What is most important — the funding? An ideal legal framework? Infrastructure?

For sure, it’s a combination of different things. There is a huge need for infrastructure: if you don’t provide high quality gigabit network infrastructure, then the small ambitious SME will find itself hampered and incapable of really succeeding, just because of a lack of infrastructure. Then you need a regulatory ecosystem that is responsive to the needs of startups. Then of course there needs to be access to finance. But there is also a huge need for skills and qualifications. If the future workforce grows up with limited digital skills, this is a major impediment. And there is also another element: the fact that international competition is also attracting foreign direct investment to Europe. The Commission is presently promoting a new approach that would allow for a pan-EU system of investment screening to avoid that promising European tech companies, which have received considerable European public support, be taken over by foreign investors, possibly having negative repercussions for European safety and security.

How could Europe prevent that?

What should be the next steps in EU legislation concerning digitalisation?

I think that there needs to be more clarity for the European market regarding cybersecurity. I think cybersecurity could be a specific quality of European IT that distinguishes it from competitors elsewhere. Of course, you cannot approach this in a roundabout way, you probably should look at it sector by sector, but I think we should make a concerted effort to guarantee and to further cybersecurity, to avoid weaknesses and also to include those that are currently afraid that of putting their intellectual property at risk, because they don’t trust cybersecurity.

What is there anything else you would like to mention?

It is a positive political signal that the EU today has a commissioner for digitisation. If you look around Europe, there are not that many countries that have drawn the same conclusion. I think all countries should have a higher authority, a ministry or similar, that assumes all responsibilities around digitisation. The current division of tasks and responsibilities hampers progress in this area. 

Cybersecurity could be a specific quality of European IT that distinguishes it from competitors

Eureka National Project Coordinator Patrick Cornet on the BpiFrance success story and its French Tech / French FAB initiatives.

BpiFrance was created in December 2012 by bringing together Oseo, CDC Entreprises, the FSI and FSI Regions. Since then, it has become an essential partner for French companies and investors. The state-owned, privately run bank offers all the public financing tools that allow entrepreneurs to think bigger and go further. Last year, more than 80,000 businesses of all sizes, from startups to large caps, have received more than €26 billion in investments, loans and guarantees.

First of all, BpiFrance, which is deeply rooted with its 48 branches across France, acts as a public-sector bank and finances projects that are considered to be more risky, because they are very innovative or involve SMEs. But the French member of the Eureka network is also one of the biggest European investment funds, managing more than €26 billion, including stakes in Orange, Peugeot and a lot of smaller companies. Finally

EU Policies and Financing on Digitising European Industry


9
Bpifrance stimulates export by insuring French companies and their foreign clients. “We are clearly stimulating the rejuvenation of the French economy,” says Bpifrance CEO Nicolas Dufourcq. A recent survey shows that half of young French would like to create their own company rather than work for large companies. More and more startups emerge, particularly in biotech, medtech, fintech and renewable energy, stimulated by the volume of venture capital that has tripled in France in the last three years.

Rescoll is a champion in collaborative R&D. Specialized in developing and testing different polymer materials, the company recently bought a manufacturing plant and is diversifying its business model.

The researchers of Rescoll love working together. “We actually have 19 collaborative projects. Eleven with French partners and eight with European companies,” explains Magali Clavé-Henry, who develops those projects and partnerships for Rescoll. Very familiar with the Eurosstars programme, Rescoll has been selected for funding three times and has already been granted nearly half a million euros. Next year Rescoll with its Danish partners Biomedics and the Danish Technological Institute will develop catheters that prevent bladder infections and a new type of rubber with the Spanish Centro Tecnológico Riojano and a large company active in the automotive sector (see box for info on the project).

“In the beginning, Rescoll was specialized in technical studies for innovative bonding processes. We now master a lot of different polymer materials, like composites, resins and coatings, but also related fields like 3D printing or environmentally-friendly surface treatments,” says Rescoll’s CEO Clavé-Henry. Rescoll currently has 100 employees who assist SMEs without their own R&D department, but also big companies like Airbus, General Electric, Astem and Louis Vuitton, in their search for better and, often, cheaper solutions. With its two facilities located in Rochefort and Pessac, both near Bordeaux — a city famous for wine but also its proximity to the flourishing aerospace-sector in Toulouse — Rescoll has developed close relations with aircraft manufacturers. Some years ago, the company decided to diversify its business areas, including medical and energy sectors.

“At Rescoll, we always have a lot of new projects in mind,” smiles Magali Clavé-Henry. "What is very interesting, and promising for the future, is that Rescoll has changed its model and is able to support its clients to higherTRLs (technology readiness level) by offering manufacturing capabilities," he adds. In 2015, Rescoll bought a chemical plant in the centre of France, where complex paint and other coatings can be produced. “At Rescoll, we always have a lot of new projects in mind,” smiles Magali Clavé-Henry. No doubt that Rescoll will stay among the most active French applicants to the Eurosstars programme.

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BPI GROWTH

MONEY ALLOCATED TO BUSINESSES

€ 24.4 B IN 2016

€ 23 B IN 2015

€ 21.7 B IN 2014

La FRENCH TECH

According to ce Insights, Bpifrance is actually the world’s most active sovereign wealth fund investing in private tech companies (in terms of number of operations).

‘At Bpifrance, we think it is not only about money,’ explains Nicolas Dufourcq, who supervises more than 2,500 employees.

We act as a social network of businessmen with a bank around it.’

Consulting missions, training and networking days have become an important part of the offer. Bpifrance has set up ‘accelerator-programmes’ meant to coach a group of selected startups during 18 to 24 months, and help them grow their companies. The bank was also a founding partner of the ‘French Tech’ label in 2015. Associating French startups under a single banner in the face of international competition, this red rooster logo has become very popular, for instance, at the Consumer Electronic Show in Las Vegas, where France has the second largest contingent after the USA.

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FUTURE OF MANUFACTURING

FIND YOUR NICHE
(BUT DON’T GET LONELY THERE)

DIGITISATION WILL BE INCREASINGLY IMPORTANT,
BUT IT IS RARELY THE MAIN REASON FOR
A COMPANY THRIVING.

‘THE NEW INDUSTRIAL REVOLUTION’ AUTHOR PETER MARSH
EXPLAINS TO US HOW NETWORKS AND NICHEs PUT
MANUFACTURERS ON A TWIN TRACK TO SUCCESS.

The head office of Blaze in
an old industrial building in London may look
unimpressive—but it’s at the centre of a web of relationships that connect
the small bicycle accessories maker with collaborators spread globally.

Blaze is among the exponents of the manufacturing network, an idea growing in importance as production
companies particularly those in niche fields step up ways to link with others. A young company with just
over 20 employees, Blaze is a pioneer in novel lighting for bicycles. Its best-known product is a new form of

“We use Japanese batteries, some of the components [in our electronics] are Japanese or Korean, the laser is German and some of the optical components are Taiwanese.”

But Blaze’s interest in relationships goes well beyond manufacturers’ decades-old pre-occupation with finding good parts suppliers. Like many companies, Blaze has constructed what amounts to its own ecosystem of collaborators and partners—in Blaze’s case in the burgeoning global bike industry.

The sector has mushroomed in recent years thanks to increased interest particularly among young people in urban cycling, and now encompasses thousands of mainly small businesses in both manufacturing and services. As well as keeping close to some of the big LED light source producers such as Nichia of Japan and Germany’s Osram, Blaze connects via meetings and digital links with a range of diverse and little-known groups including Swedish mudguard maker Ass Savers, Germany’s bike...
sharing specialist Next Bike and Australian clothing supplier Vegan Athletic.

Blaze illustrates how connections count. Also it has the right sort of products: many of the world’s expanding manufacturers are in a niche field shielded from heavy competition but with a big global market. At a time when many companies and policymakers are interested in new ideas to boost Europe’s manufacturing strength, networks and niches should be put high up the list of concepts that need to be encouraged by governments, think tanks and trade groups. Such thinking should go alongside the usual exhortations — now somewhat tired — to increase investments in digital manufacturing under the broad heading of Industrie 4.0.

Driving on the idea that networks and niches are growing in importance are two broad trends — rapid technology development and the opening of the world through globalisation.

As technology advances have created more possibilities for variants on products and services, individual sectors can be split into a much greater number of subdivisions than was the case 20 years ago. In this climate, companies in narrow parts of a much larger industry can progress.

Examples include the US’s crop sprayer maker AirTractor, Government organisations should do more to promote the sharing of ideas by getting big and small companies in related fields to talk to each other.
which occupies a “sliver” of the wider aircraft business, and Cochlear, an Australian leader devices inserted inside the ear to help deaf people, a small segment of the immense medical implant sector. At the same time, a company in, say, Spain now has a much wider range of possible partners in many areas from research and development to sales, a result of the emergence of a host of new players from areas including eastern Europe, China and India. Blaze is a good example of a business which combines an interest in both networks and niches — as do many of the other firms inside its own individual ecosystem.

Another company that has used the twin ideas of networks and niches as a vehicle for both improving its products and adding to sales is Goppion, based near Milan. The 50-person Goppion is a leader in a highly specialist field — making customised museum cases to display valuable and historic works of art. Items protected by the company’s cases include the Crown Jewels in London and the Mona Lisa in the Louvre. Goppion’s ecosystem encompasses many of the world’s top international museums in countries from China to Egypt. Much closer to home, it also has close links with a network of about 35 small businesses, mostly clustered close to Milan, and which provide key parts in areas such as lighting, electronics or structural supports. Sandro Goppion, Goppion’s president, calls these firms not suppliers but “co-makers”. He says: “It would be virtually impossible for us to have available inside our company the range of capabilities that our co-makers have at their disposal. Our ability to work with these companies on specific jobs for customers gives us a wide sweep of options and helps us to do a better job for than would be possible were we to reply solely on what we can do inhouse.”

The interest in ecosystems is shared not just by small businesses but by many big companies. It would be hard to label some of these “niche players”. The electronics giant Apple and the German giant Siemens are good examples. It is however possible to regard these companies as instances of businesses that either started out in a niche and became a lot bigger — Apple after all started as a small producer.

Both policymakers and business groups need to think more strategically about the ingredients needed to create successful manufacturers.

UPCOMING CHALLENGES

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EDUARDO BELTRÁN DE NANCLARES

is the Chairman of the new EUREKA Cluster SMART on Advanced Manufacturing, as well as Innovation and Technology Director of MONDRAGON Corporation. He has 35 years of experience in Technology and Product Development and Innovation Management, in sectors such as Automotive, Household Appliances and Capital Goods.
of particularly “user friendly” computer hardware—or a business such as Siemens whose activities are split into many small slivers of the business world.

Apple has a long-term strategy of forming links with key technology companies whose ideas are important in embellishing its products. Apple’s pockets are deep enough to allow it to have bought many of these businesses, to gain unrestricted access to their development ideas.

For instance in recent years Apple has taken control of the US sensor maker Fingerworks; PowerbyProxi, a New Zealand pioneer in power management; Regaind, a French computer vision company; and Germany’s Metazoo and Vrvana of Canada, both specialists in virtual reality.

In its data sharing and computer-aided analysis operations, Siemens has a keen interest in connecting with a range of outside firms, whose specialist knowledge in fields such as sensors and software the German engineering leader finds useful. For instance four businesses of varying sizes and based around the world—Germany’s Eosoft, the UK’s Senseye, Bluvision of the US and Atos of France—are all collaborators in a Siemens’ data sharing platform called Mindsphere that helps to facilitate activities such as connecting up machines in factories to assist maintenance or check on technical failures.

The overall challenge in creating a true digital industrial environment is, in most cases, the transition from a legacy manufacturing mechanism. The implementation of flexible, efficient and fast digital manufacturing techniques requires a completely new way of thinking, followed by a process of adaptation of old methodologies and equipment involving complex system and sensor integration.

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The idea of hooking up with other companies frequently extends to connections concerning manufacturing equipment, especially in specialist areas where machines need to be tailored to meet the specific requirements of one manufacturer.

For instance, the Brazilian aircraft maker Embraer has close links with several machine suppliers—whose equipment adorns Embraer’s big production site near Sao Paolo—including Japanese robot leader Fanuc, the US automation specialists Encore, Electroimpact and Bastian, and Norway’s warehouse picking supplier Autosbroker.

Connections with customers—which clearly belong to the ecosystem of the firm that is supplying them—have always been important. It would be absurd to state that manufacturer/customer interactions are part of a new trend. But in many

UPCOMING CHALLENGES

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PETER CONNOCK

has been working in the semiconductor industry for 40 years with a wide range of responsibilities in development, customer service, marketing and management. He has held long-term positions at Edwards, Applied Materials and memsstar in locations around the world. In his latest role PENTA Director at AENEAS, he is responsible for the management of the EURA cluster PENTA—focused on catalysing activity in the micro and nanoelectronics enabled systems and applications sector in Europe. PENTA will operate for 5 years, and launched its first call in January 2018.

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Should manufacturing equipment be owned or provided as a service? Will the equipment tell you when it needs maintenance and learn from experience? Can you build a virtual factory before making any investment in machinery? This is the future; requiring a completely new economic model for cost effective and flexible production. Factory simulation, through such techniques as Digital Twins and Artificial Intelligence will play key roles in future manufacturing processes.

None of this will work without advanced high-speed communications and analysis capability. With “cloud controlled” manufacturing, the secure high-speed transmission of large quantities of data, plus comprehensive local analysis, will be essential. All aspects of the manufacturing process will need to be sensed and analysed.

No longer will a factory be isolated. Service providers will monitor equipment 24/7. Advanced sensing and feedback systems will need to be installed throughout the factory. Customers will monitor their personalised products as it is manufactured, and products will be fitted with sensors providing their designers (and users) with feedback about the behaviour in the field. All this requires full deployment of the IoT in the industrial environment and beyond, covering the full life cycle from design to recycling.

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industries the nature of the dialogue between the maker of goods and the company it sells to has been changed by shifts in technology or consumer tastes. This has increased the importance of the manufacturer/supplier ecosystem through making the interactions much more fluid. One example is in making cans for beverages — where the business has been disrupted by the entry of many smaller players (for instance in craft beers) which require a range of highly varied containers to differentiate their products from rivals. Erik Smuts, a senior executive at Nampak, a big South African can maker, says: “Our customers now make many more niche products than used to be the case. They need to show what they are selling is different. To fit in with their needs we must make a bigger range of cans. As a result, our [canmaking] machines must switch to creating different products twice as often as happened 10 years ago.

That creates some challenges for us. If we are to stay competitive, we must be able to cope with the new requirements.”

What lessons can be learned from this analysis? Companies need to become more fully aware of the opportunities from networks and niches. More case studies are needed of the specific firms —big and small—that have benefited from exploiting these trends, and how they did it. Government organisations should do more to promote the sharing of ideas by getting big and small companies in related fields to talk to each other. One way to do this is to organise “matchmaking” meetings for firms of different sizes but which share similar ideas and are involved with comparable industries.

Finally both policymakers and business groups need to think more strategically about the ingredients needed to create successful manufacturers. They need to shift their analysis from the now somewhat hackneyed rhetoric about the importance of digital technologies—the internet of things, artificial intelligence, 3D printing, smart data transfer and other parts of Industry 4.0 thinking. Digitisation will be increasingly important. Companies that are already good will become better by taking on the new thinking. But it’s rare to find a manufacturer where the main reason for its success is its strength in

Behind most companies that excel in a specific field of manufacturing are almost always technologies and ideas with only a tangential link to digitisation.

UPCOMING CHALLENGES
euripides-eureka.eu

JOCHEN LANGHEIM

is the chairman of Euripides, EUREKA’s Cluster on smart electronic systems. Having a PhD in Electronic Vehicles from Aachen University, he has more than 25 years in automotive electronics and a broad network of cross-industry activities.

1 FULL CONNECTIVITY
2 COLLABORATION A MUST
3 SECURITY BY DESIGN
4 MORE SENSITIVE POPULATION
5 NEW OPPORTUNITIES WITH HIGHER COST PRESSURE

The possibility to trace material, products and movements in manufacturing and in the supply chains will lead to new business models and new product ideas.

The innovation tempo will accelerate and lead to a reduction of the industrial development cycles together with a reduction of products life time and of investments depreciation. Transnational collaboration is a must!

New production technologies will lead to an exponential growth of the number of products and associated data. Artificial intelligence will help to increase productivity while maintaining a high level of quality. However, with more data comes more sensitivity and thus data security will become an even more important challenge. Safety and security by design is key.

Similar to ecologic movements, data privacy (and somehow data pollution) will have an important, sensitive role. The smart factory of tomorrow will need to respond to social criteria such as privacy and the right to forget. Privacy by design is key.

The pressure on costs will remain a main driver for industry to improve. Integration of solutions, system approaches for optimization, the right mix of hardware, software and connectivity will be a key success factor for European industry. And all this with a high speed of research, development and Industrial deployment.
Industrie 4.0. Behind most companies that excel in a specific field of manufacturing are almost always technologies and ideas with only a tangential link to digitisation. The ability to connect with others and to exploit the advantages of niche operations are often key elements. To build the champion companies of the future, these lessons must be absorbed.

The ability to connect with others and to exploit the advantages of niche operations are key elements.
<table>
<thead>
<tr>
<th>SINEM ALTUNCU</th>
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<tr>
<td>is the Chairwoman of EUROGIA, EUREKA’s Cluster on low carbon energy technologies. Sinem began her career in the banking sector and served in several roles including branch manager and resident vice president at CITIBANK, before having become CFO at CAROTEC in 2010. In early 2015 CAROTEC Group joined the EUROGIA Board with the aim of generating proposals in the fields of energy efficiency and management. Currently Sinem is leading the Grants &amp; Incentives team at CAROTEC and oversees transnational collaboration projects.</td>
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<th>OLE KÖSER</th>
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<tr>
<td>is the Chairman of the EUREKA Cluster Metallurgy Europe. He entered the metallurgy field 20 years ago by joining Hardtop Giessereitechnologie GmbH in Magdeburg, Germany. Five years later, he moved to Calcom ESI, which was one of the first startup companies from the Ecole polytechnique Fédérale de Lausanne (Switzerland). Within ESI Group Ole Köser is currently responsible for managing innovative projects and services – thereby further developing ESI software solutions in the domain of casting and metallurgy. He is the author of several publications, mainly in the domain of modelling of industrial casting processes.</td>
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<th>UPCOMING CHALLENGES</th>
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<th>METALLURGY COMPATIBLE TO INDUSTRY 4.0</th>
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<td>Metallurgy is required to be compatible with Industry 4.0. The whole industry including the one that is related to the manufacturing of metals and metallic products is undergoing currently a fundamental and disruptive change. The integration of information technology in the manufacturing processes need to reach a considerably improved level in comparison with the current situation. As the global competition is developing more and more momentum this is required for the European Industry to compete on a global market.</td>
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<th>ADDITIVE MANUFACTURING</th>
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<tr>
<td>The area for manufacturing of metallic parts with the highest speed in terms of development is currently additive manufacturing. As being on one hand a straightforward and very flexible approach to produce parts a lot of challenges still have to be solved for real industrial applications. Key points for enabling additive manufacturing further is the development of specific alloys that are working well for powder production and deliver also the required mechanical properties.</td>
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<th>POWER MANAGEMENT AND ENERGY EFFICIENCY</th>
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| There is more than the basic need for energy availability and reliability while running smart industry. Challenges are:  
- New energy efficiency regulations for Smart Industry  
- Increasing usage of energy in IoT for Smart Manufacturing solutions while providing energy efficient solutions for end users.  
- Strong need for reliable and available energy management for hyper connected reality. |

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<th>ENERGY STORAGE AND DEMAND RESPONSE</th>
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| These will help address the sustainable energy consumption challenge for smart manufacturing. Challenges are:  
- Data connection detecting the current level of renewable energy and the market price enabling the convergence of energy generation and consumption  
- Obtaining energy storage solutions to address security of supply and grid flexibility  
- Reducing peak loads through broad energy storage capacities |

The full series ‘Upcoming challenges for smart manufacturing’ is published online: eurekanetwork.org/news
NETWORK DEVELOPMENTS

COLLABORATION CREATES BETTER RESULTS

EUREKA AND THE ENTERPRISE EUROPE NETWORK—TWO WELL-ESTABLISHED AND STRONG NETWORKS.

Both support companies in technology development and transfer of research results to the market. However, for some the network is still fairly unknown territory.

“But the better we collaborate, the better for our joint clients” say Enterprise Europe Network and EUREKA experts Andrea Kindler and Irina Slosar.

The Enterprise Europe Network is the world’s largest support network for small and medium-sized enterprises (SMEs).

The Network is active in more than 60 countries worldwide and brings together 3000 experts from 600 organisations. Member organisations are diverse and include innovation support organisations, universities and research institutes, chambers of commerce and industry.

The Network helps ambitious SMEs innovate and grow internationally. It combines international business expertise with local knowledge and provides personalised services such as:

• International partnerships
• Advice for international growth
• Support for business innovation

The Network’s expert groups cover all key economic sectors, from healthcare to agri-food, from intelligent energy to fashion and textile.

Both EUREKA and the Enterprise Europe Network support innovative companies with the ambition to collaborate internationally and therefore foster innovation-driven entrepreneurship. While EUREKA focuses on funding innovation in over 40 countries, the Enterprise Europe Network, with its 600 member organisations, is in close contact with the companies and R&D institutions in its regions.

WHERE AND HOW CAN THE ENTERPRISE EUROPE NETWORK AND EUREKA COLLABORATE?

Both our networks can make companies aware of each other’s services and funding opportunities and cooperate along the project life-cycle: find partners for a project idea (Enterprise Europe Network), fund the project and help to find investors (EUREKA), promote project results (both networks) or launch innovation globally (Enterprise Europe Network).

Suitable projects and partners can be matched, either via direct contact, profiles, brokerage events or the Enterprise Europe Network marketplace. In short, the collaborations widen access to services for our joint clients and consequently increase the number of partnerships and projects and improve the results!

THE BENEFITS

• Access to high-potential clients for EUREKA projects
• Increase of quality of services (as a collaboration results in a holistic approach for a client—offering all type of support from advice on funding, partner search, funding itself, commercialisation by the two networks)
• Acceleration of market launch of innovation for EUREKA projects via the Enterprise Europe Network

Eurostars and Clusters organise several events suitable to increase the international network of SMEs and offering them a concrete collaboration opportunity—like EUREKA Innovation Days, Cluster Project Outline Days or Eurostars matchmaking events.

Joint promotion of these events as well as the bilateral and multilateral EUREKA and Eurostars calls, would further increase the number of partnership agreements.

The easiest way to get in contact with the Network in your region is by finding out about the regional contact point via the official website: een.ec.europa.eu/about/branches

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GETTING IN TOUCH WITH THE ENTERPRISE EUROPE NETWORK

The easiest way to get in contact with the Network in your region is to find out about the regional contact point via the official website: een.ec.europa.eu/about/branches
n manufacturing around the world, industrial robots are becoming increasingly common. This is especially so in higher wage cost countries, where robots have made a significant impact releasing the human workforce from repetitive and strenuous production line operations.

Digitisation of industry is important for increasing competitiveness in Europe and the use of industrial robots is now moving into smaller companies. However, introducing robotics to small-scale manufacturing is a challenge as, typically, they have more complicated production operations, often needing to change processes and production, and they may also often lack the necessary technical competence and capacity. “This introduces bottlenecks to the introduction of robots as there is a higher installation cost due to the need for experts to tune the production system on site and any change in production may also require the presence of an expert—which can be a significant cost,” explains Professor Trygve Thomessen, Managing Director of Norwegian high-tech robotics system integrator, PPM AS.

ENTER iVAR

iVAR, the Intelligent Versatile Avatar Robot, aims to solve this bottleneck and enable wider use of robots in manufacturing. iVAR is an intelligent mobile platform with multimedia communication and a robot arm, providing autonomous or tele-operated, inspection, diagnostics, training and programming for industrial robot and automation systems. The aim is to provide instant services to reduce production stoppage time. iVAR can carry out its services inside or outside the industrial robot cell, or be a collaborative assistant to the local industrial robot. “The iVAR solution means issues can be solved remotely, providing instant help and saving cost,” says Trygve. “This makes clients happier and more motivated to install more robots in the future.” Remote assistance is the key element of the iVAR concept, which is being developed in a Norwegian-South Korean collaboration. The iVAR avatar is designed to interface fully with the vast majority of robot systems available commercially, accessing cameras in the robot cell and other sensors. Data is acquired locally and then transmitted to an expert who could be situated anywhere in the world. A local communication interface is also available to enable the company’s engineers to do any necessary physical adjustments on the spot such as reconfiguration and reprogramming.

BLACK BOX

iVAR is very much a black box system. The software behind iVAR—its brain—is called FlexGUI 4.0 and can acquire data from all types of devices on the market using an open source interface, ros Industrial. It is intuitive and with just a half-day training, customers can get iVAR working for them logging data fast. FlexGUI can be run on all tablets, smart phone or laptops and is being commercialised now.

The iVAR avatar robot itself is in its final development phase and able to move autonomously in the robot cell. It is envisaged that customers would only need this assistance on site temporarily during the commissioning phase of a new process. So, the robot would be rented to most customers with a few, larger companies purchasing.

iVAR recently won a prestigious robotics prize in Korea and Trygve is working with his Korean partners to commercialise iVAR. “Now we are testing the market and in good discussions with potential partners in Korea and Japan and starting to talk to European manufacturers,” says Trygve. Commercialisation will start to ramp up during 2018 and Trygve hopes to conclude between 500 to 2 000 licences for iVAR’s tablet software from 2019/20.
SATELLITES TO BATTLE THE DIGITAL DIVIDE

A FRANCO-FINNISH CONSORTIUM DEVELOPED A NEW GENERATION OF SATELLITE TECHNOLOGIES TO DELIVER FAST INTERNET TO REMOTE COMMUNITIES

Six publications and two patents* demonstrate the scientific quality of the research performed

Researchers at Thales Alenia Space and some of its Finnish suppliers spotted the potential of High Throughput Satellite (HTS) more than six years ago.

They gathered an impressive European consortium for Euripides project MMWIN to develop the first building blocks for use in a new generation of products.

MMWIN can be seen as a technology tool box to pave the way for future high capacity satellite services,” says Olivier Vendier, project coordinator for Thales Alenia Space.

“Doctors in rural areas who need high amounts of data could get that even in places where there isn’t good telecoms coverage.”

The project included members from the entire European supply chain, from French industrial giant Thales through to French and Finnish small and medium-sized companies and research institutes.

With capacity being stretched on the Ka-band, frequently used by satelites, the partners researched ways to reuse frequencies and to design, manufacture and test products to be used in “transponders”—devices that receive radio signals and transmit another signal—in the Q/V bands, which is between 40-50 GHz.

While Thales Alenia worked on the satellite converters and amplifiers, the Finnish companies led by vrt focused on short point-to-point radio. The group had to research ways to limit problems such as unwanted radiation and damage to some of the materials used in the components. At one point, cracks appeared in some of the ceramic connectors developed. They had to change their composition as a result.

Through painstaking cooperation, the team of 25 engineers, technicians and marketing people managed to develop products for their companies. Vendier estimates that the validated solutions could be ready for commercialization by 2018-2020. “We’ve developed a toolbox for the next generation of satellites. We’ve moved from 3 or 4 on the Technology Readiness Level to 6 or 7,” he says, with a maximum of 9 denoting a product ready to launch.

The partners are convinced the development wouldn’t have happened as fast as four years without the exchange of valuable expertise. Their regular teleconferencing and six month meetings in different parts of France and Finland expanded everyone’s horizons and even forged friendships.

“The only place we never met was the north of Finland: too cold!” laughs Vendier.

The companies hope they can sell into a growing market. A report by market researcher Research & Markets estimates total HTS capacity lease revenues will hit about €5 billion by 2025, generating over €30 billion in aggregate revenues from 2017-2025.

MMWIN has laid the basis for a full European value chain gathering SMEs and a large industrial group capable of delivering innovative inter connexions systems and passive components for strong value-added products in land and space telecommunications applications.

---

*[5] P. Quéfleuc1, J.P. Ganne2 and G. Martin3
*[2] TOTAL COST
***

COUNTRIES & NATIONAL FUNDING BODIES

FINLAND
TERES

FRANCE
Ministère des finances et de l’Économie

MAIN PARTNER
THALES Alenia Space, France
www.thalesaleniaskpace.com
jadiscapreli@thalesaleniaskpace.com

OTHER PARTNERS

FINLAND
VT R DORMETIC SEIMIC

FRANCE
Gifhoram Dédiement Multiproject CNES CNRS UCL ENSEEIHT Grenoble IRIMAT Thales corporate research centre University of West Franche-Comté

TOTAL COST
**4.3 MILLION
*** DURATION
November 2012 to December 2015

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CLUSTER PROJECTS

For SMEs, a Cluster project is ideal for a collaboration with a major player.

Current Eureka Clusters

Focus on particular industrial sectors in different countries: hardware, software, telecommunications, renewable energy, new materials and more.

Celtic-Plus
Telecommunications

Euripides
Small telecommunication systems

Europia2020
Low carbon energy technologies

ITEA 3
Software intensive systems and services

Penta
Micro and Nano electronic technologies and applications

Metallurgy Europe
Breakthrough metal products

SMART
Advanced manufacturing

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FIND OUT MORE AT eurekanetwork.org/clusters

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31
Breaking Down Global Language Barriers


A EURAK-Funded Collaboration Has Brought This Ambitious Concept One Step Closer to Reality.

Imagine you are a financial journalist about to follow an important stream of press conference in a language you do not understand. Then imagine you are able to follow every word perfectly, instantaneously.

Through pioneering new speech recognition, sentence identification and dynamic vocabulary technologies, the EURAK Network project MEDIATRANSOLATOR project has developed the first real-time video translator, linguistically optimised for the financial sector.

Dream Team

This success is the result of successful cooperation between Lexifone Communication Systems in Israel and the German company European Media Laboratory GmbH (EML). “The technical challenge here was not so much the issue of translation as much as the issue of speech recognition,” explains project coordinator Dr. Ike Sagie, Managing Director of Lexifone. “Current technology does not handle two people speaking at the same time very well. Our breakthrough was achieving the ability to differentiate between two speakers, increasing the accuracy of the transcription.”

EML provided deep-learning-based speech recognition algorithms and a highly scalable transcription platform for automatic transcription of the speech content of video feeds. Smart segmentation technology supports instant translation, and the speech recognition vocabulary can be dynamically updated within hours. The team believes that the combination of these solutions provides for superb transcription accuracy. Finally, a demonstration application was developed in order to help visualise the results.

Starting a Global Conversation

Both partners see MEDIATRANSOLATOR as an important stepping stone towards their respective global ambitions. “I set a goal ten years ago to develop a solution that could overcome global language barriers and enable communication with anyone on the planet,” explains Dr. Sagie. “The reason why the major tech players have not already done so is because such an innovation requires extensive customisation. There is simply no one-size-fits-all solution for this level of accuracy.”

Other potential beneficiaries for this ‘industrial strength’ machine translation include high level diplomats involved in delicate calls with foreign counterparts, major call centres and telecom carriers. Machine translation could create huge operational efficiencies, and help carve out new revenue streams. “This project represents an important building block towards the realisation of my overall concept,” explains Dr. Sagie. “I’m advising large organisations, call centres and telecom carriers how to build customised tailored solutions.”

For EML, the EURAK project has helped the firm to enrich its technology portfolio with assets that can be re-used in other areas including smart homes or the smart vehicle market. “Apart from the successful R&D activities, we have benefitted from business-wise by having been exposed to financial services, a new market segment for us. We have since identified a number of potential new service offerings and built contacts with new customer communities,” says Volker Fischer, Head of Research at EML.

EML received funding from the German central innovation programme for SMEs (IZW), a funding programme of the Federal Ministry for Economic Affairs and Energy (BMWi), while Lexifone Communication Systems was funded by the Israel Innovation Authority.

Looking to the future, Dr. Sagie notes that interesting research results are currently being produced on vocalising text in one’s own voice, and that he expects to be able to embed this technology within five years. He also stresses that this is a long term project, one in which a great deal of time and resources must be invested. “A major obstacle is hesitancy because the concept is so new,” he says. ‘People are still unsure about having a robot interpreting their call.”

EUREKA's most flexible instrument.
Applications can be submitted all year long.
Open to any type of organisation and technology.
Tap into national innovation support programmes in 40+ countries.
“THE DIGITALISATION OF EDUCATION WILL CHANGE THE WAY WE LEARN FOREVER”

VESPA PERÄLÄ
FROM DISGRUNTLED STUDENT TO EDUCATION TECHNOLOGY PIONEER.

He tells us how he came to found Claned; a digital learning environment looking to overhaul the very fundamentals of how we learn.

“People learn in different ways, at different speeds and are motivated by different things. But the traditional Education System is a one-size-fits-all model. Claned monitors a user’s interaction with educational content and simply ‘learns how they learn’.

This means we can personalise each user’s learning experience to suit their abilities, interests and preferences,” says Perälä.

The idea of understanding how people learn is not revolutionary. In fact, researchers have been studying this area for decades. But what is yet to really happen is the conversion of this theoretical knowledge into practical digital application. “What we’re doing, is taking the metrics from academic research and applying algorithms that mirror their findings through the solution. For example, Claned allows users to highlight, comment and ask questions on content. So as you study, Claned will analyse your learning interactions,” he says.

Based on its analysis, Claned can make many assumptions about what topics are causing you difficulty, what your interest areas are, how quickly you learn and whether you’re an independent learner or someone who prefers interaction. Then it can recommend other personally relevant material to you and link you with others anywhere in the world who could help you.

ENTREPRENEURIAL UPBRINGING

Given his current venture, it’s perhaps unsurprising that Vespa was left uninspired by his own experiences in education. “I didn’t have the patience in school to sit and listen to someone talking for 4 hours, explaining things in ways that didn’t make sense to me. I craved debate and practical work but for the most part, this wasn’t available,” he says. “Even at university, the assignments didn’t prepare me for the realities of an actual professional learning environment.”

All of us can empathise with this experience and yet we don’t all become pioneers like Vespa. So what was different about him?

“I come from a family of entrepreneurs so from an early age, I was thinking like one. I remember in primary school running a little store and later in university, I founded my first consulting company.”

A 10-year stint at Nokia during its boom years helped shape Vespa’s understanding of the possibilities in technology and in 2008, he began investing in companies himself.

“This was a steep learning curve because when your own money is at stake, you really pay attention to the consequences of your actions and you’ll perish if you don’t learn from your mistakes.”

TECHNOPHOBIC INDUSTRY

His entrepreneurial eye guided him to the possibilities in Education Technology and eventually, the founding of Claned in 2011.

However, the Education Industry is an anomaly in the current high tech climate in that it has been slow to adapt to digitalisation. In a world where internet users are accustomed to finding accurate and concise information quickly, it’s only a matter of time before the Education Industry will be forced into mass reform.

“Many of our customers today are organisations whose content is closed to the public. But this year, we’ll launch cooperations with multiple partners. This is extremely exciting because it’s the content that’s fed into Claned and the more people that interact with it, the more information the system can gather about learning patterns which will ultimately benefit the users.”

So don’t be surprised to see Claned nested between WhatsApp and Hailo on your phone in the near future!

HIS ADVICE TO OTHER INNOVATORS

Be relentlessly persistent. Fail fast. If something isn’t working, move on quickly. Surround yourself with smart people!
Achieving rigorous and robust impact evaluation is a challenge—but not an impossible one to resolve.

EUREKA DATA ANALYST PETER LALVANI ON RECENT DEVELOPMENTS IN EVALUATION OF INNOVATION POLICY AND PROGRAMMES

Achieving rigorous and robust impact evaluation is a challenge even for funding agencies and other organisations with large dedicated budgets.

Despite sharing of best practices and recent advances—in open source software, data analysis and big data—for smaller organisations, the costs can seem to outweigh the benefits. Pricey external consultants are often the only option where internal resources do not support continuous programme of assessment.

In terms of methodology, some of the major challenges faced by public agencies which fund innovative activities include:

- Data-gathering: robust and independent data to measure impact, particularly on SMEs, can be difficult to find. Subscription to proprietary databases such as Bureau van Dijk’s Orbis or Amadeus requires a fee and time series data for relevant indicators may be incomplete or non-existent for many participating companies.
- Counterfactual analysis, requiring matching with a control group of similar companies, brings further data requirements.
- Self-reporting: the most interesting relevant indicators to a particular programme or intervention often require self-reporting in the form of questionnaires. While this has the benefit of generating tailored and relevant data, response rates can be low and responses may be affected by bias.
- Evaluating effects on large organisations: participation in a programme may have a measurable impact on a SME (e.g., an increase in turnover or employment), the impact on a large company can be more difficult to determine. Moreover, the effects may become noticeable only over a number of years.
- Time lags and spillover effects: medium or long-term effects of a programme on individual participants and their networks are difficult to capture, requiring investment in data and/or resource-intensive qualitative methods.

Thankfully, a number of resources and initiatives have been launched in recent years to help make the most of innovation impact evaluation (see below).

EUREKA’S APPROACH TO IMPACT EVALUATION

EUREKA believes that robust impact evaluation is necessary to demonstrate the added value of international collaboration via EUREKA projects. As the national funding agencies which constitute the EUREKA Network are increasingly required to demonstrate the return on investment of their programmes and become more aware of the expanding techniques available for evaluation, EUREKA’s activities in the area are constantly evolving.

Key principles underlying EUREKA’s impact evaluation:
- Aim for counterfactual assessment based on control groups
- Aim to identify and where possible, measure the specific added value of international collaboration in close-to-market projects to SMEs and research organisations
- Use qualitative techniques (via surveys and interviews) to complement quantitative measurement where necessary, to provide a richer and more meaningful analysis

Some interesting recent initiatives

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Some interesting recent initiatives

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<tr>
<td>JGMI</td>
<td>Innovation Growth Lab, a new international collaboration, run by Innovation Foundation Nesta, that promotes the use of experimentation (e.g., via randomised controlled trials) in the area of innovation and high-growth entrepreneurship. With an extensive research network, JIGI is supported by partners including a number of EUREKA members and other stakeholders.</td>
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<tr>
<td>IPP</td>
<td>The Innovation Policy Platform, developed by the World Bank and the OECD, IPP is a web-based interactive space which facilitates knowledge exchange and collaboration across countries and regions.</td>
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<tr>
<td>EUROPEAN COMMISSION MUTUAL LEARNING EXERCISES</td>
<td>Its aim is to identify good practices, lessons learned and success factors based on robust evidence. Mutual learning exercises have addressed topics such as the Administration and monitoring of R&amp;D tax incentives, Evaluation of business R&amp;D grant schemes—including the use of big data techniques—and the Evaluation of complex public-private partnerships, among others.</td>
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<td>SIPE</td>
<td>The Science and Innovation Policy Evaluation Repository, a central source of knowledge on science and innovation policy evaluation, providing online access to policy evaluations and an annotated list of this content that is searchable by policy makers and other stakeholders.</td>
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Find out more at eurekanetwork.org/impact-assessments-2017
**WHAT IS EUREKA?**

www.eurekanetwork.org

EUREKA is a publicly-funded, intergovernmental network, involving over 40 countries.

EUREKA’s aim is to enhance European competitiveness by fostering innovation-driven entrepreneurship in Europe, between small and large industry, research institutes and universities.

Today, in this network, there is more than ever a strong belief that cross-border collaboration is crucial for European industry to compete effectively on world markets in advanced technologies.

While innovation is increasingly becoming an international activity, 90% of the public funding available to researchers and innovators in Europe is to be found in national programmes and most of it is dedicated to national activities. This is why the EUREKA network ensures that a steady flow of national public funds is directed towards transnational collaboration in research, also leveraging a high level of private investment.

To innovative companies, institutes and universities wishing to expand their activities internationally, EUREKA is a catalyst for the finance and support they need to launch and run their transnational R&D&I projects. Those projects are based on two criteria: cooperation between at least two different EUREKA countries, and the final result being a commercially viable new product, process or service.

**GET IN TOUCH!**

www.eurekanetwork.org /eureka-countries

EUREKA strength lies in its well-established network of national project coordinators (NPCs) representing more than 40 countries and the European Commission.

NPCs act at operational level, running the National EUREKA Offices. They are the direct contact for project participants. NPCs facilitate the setting-up and running of a project and are responsible for project generation, national and international support and follow-up.