International Conference

INDUSTRY 4.0
IN PRACTICE

JUNE 2ND AND 3RD 2016
SPACEX EVENT CENTRE, KEEVISE 6, TALLINN, ESTONIA

Dear Guest,

Welcome to the Industry 4.0 in Practice conference.

On 2015 Estonian Association of Information Technology and Telecommunications (ITL) together with the German Embassy in Tallinn, Estonian Electronics Industries Association and Enterprise Estonia organised a conference to discuss opportunities within Industry 4.0 framework, to bring together Estonian, Nordic and German ICT and manufacturing companies and to lay groundwork for efficient value chains in the future. On 2016 we take this further aiming to be even more practical and hands on.

This year event is dedicated to explore Industry 4.0 practical examples and case-studies from the leading companies, both in industry and ICT.

We wish you an interesting conference and useful contacts!

Christoph Eichhorn
Ambassador of Germany in Estonia

Jüri Jõema
CEO, Estonian Association of Information Technology and Telecommunications

Arno Kolk
CEO, Estonian Electronics Industries Association

Hanno Tomberg
CEO, Enterprise Estonia

PROGRAM

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June 2nd

9.00 Morning coffee and registration

9.30 Welcoming note

President Toomas Hendrik Ilves,
President of the Republic of Estonia

His Excellency Christoph Eichhorn,
Ambassador of Germany in Estonia

10.00 Industry 4.0 Implementation and Qualification at Festo

- Target definition
- Flexible automation
- Some examples from the Festo production plant
- Technology behind Industry 4.0
- Qualification for Industry 4.0

Dipl.-Ing. Mathias Schietinger,
Head of Global Solution Center, Festo Didactic

10.30 Real-Time factory in Practice

- Real-time factory, Kemppi and Orfer case studies
- Machinery Center's integration into one management platform
- Data & Network security in an integrated manufacturing process

Joni Lehtonen,
Industrial Internet
Program Manager, Tieto

Tuomas Kivisaari,
Software Product
Manager, Kemppi

Sakari Kokkonen,
Director, Orfer

11.00   Break

11.30   Process Automation Re-engineering

- Changing the processes, decision making, supply chain and business model
- Investments involved and profitability analysis
- Effect on export capabilities

Urmo Sisask,
CEO, Hyrles

12.00   Hack the Industry!

- Using hackathons to solve challenges in Industry
- Description of Gasum's and IndustryHack's organized open innovation competition "Hack the Gas"
- The challenges in opening doors and allowing hackers to develop new ideas

Matti Uusivuori,
Software Specialist, Nortal

Petri Vilēn,
CEO & Co-founder, Industryhack

12.30   Platforms for IOT and M2M

- Developing and enhancing business by taking bigger advantages of IT
- 5G creates new possibilities for industrial production
- The biggest challenges for IoT in coming years

Toomas Kärner,
IoT Area Manager, Telia Eesti

13.00   Lunch

14.00 Uber and AirBnB takeaways for Industry

- AirBnB and Uber have changed the way we look at our car fleet or real estate
- Using their example, how to squeeze the last drop out of your industrial resources

Toomas Talts,
CEO and Founder, Codeborne

14.30 Intelligent Tool Monitoring Systems

- Evaluating manufacturing costs through processes, tools and consumption data
- Wireless sensor technologies and capabilities in today's industry
- Optimizing workflow and processes and making efficient use of tools and machinery
- Preventing Hand-Arm Vibration Syndrome (HAVS) through Industry 4.0 sensor technologies

Karel Kask,
Head of Sales, Nordic Automation Systems

15.00 ABB – Connected Asset Lifecycle Management

- IT–OT convergence
- Condition based maintenance
- Decision support
- Connected work force

Peter Kavanagh,
Business Solutions Consultant, ABB Enterprise Software

15.30 Break

16.00 Digitalisation of the Supply Chain – The Intelligent Box

Bo Gunnarsson,
ICT Manager, Ericsson

16.30 Modular Electronics Factories
- Bringing electronics factories and information systems into the Industry 4.0 era
- Turning factories into a modular platform
- Enabling faster decision making and reducing the cost of integration and change

Terry London,
Product Owner, Proekspert

17.00 Innovation for the Future
- Industry 4.0 developments at Siemens
- Best practice and experience

Janne Öhman,
CEO, Siemens

17.30 Closing of conference day 1

9.00 **Green IT seminar**
Location: Viktoria Centre, Keevise 6, Tallinn, Estonia

Never before has industry taken such large steps towards making production greener. Working on sustainable solutions has provided new opportunities for both the industrial and ICT sectors. Co-operation between these different sectors as well as between countries has been encouraged by the Green Industry Innovation programme of Norway Grants, which supports green business ideas and new environmental technologies

 Keynote speaker **Anita Krohn Traaseth** is titled "Top 20 Women in Business in Northern Europe", "Top 50 Most Inspiring Women in European Tech" and "Best Female Leader in the IT Industry".

13.00 **Site Visits and Networking**
For the second half of the day we offer you the possibility to have real insights into Estonia's business environment and get a better understanding how innovation happens in Estonia. Participants of the seminar have the possibility to choose one of the following visits:

Option 1 – Ülemiste City study tour

During 3 hours you will get an overview of Ülemiste City and visit one manufacturing company, one ICT company and the e-Estonia showroom:

HELMES
Helmes is an international software development house with 200+ experts, 25 years of experience, their HQ in Estonia and clients across Europe and the US. Helmes focus on the design and development of software solutions critical for the operation of a business.

E-PROFIIL
E-Profiil specializes in the manufacturing of large, heavy and complex equipment and metal structures for the oil and gas industries. They operate manufacturing premises of 14 700 square meters in Tallinn and 1 200 square meters in Paldiski.

e-ESTONIA SHOWROOM

The e-Estonia showroom's purpose is to showcase all of the nation's ICT solutions in one facility, providing visitors with hand's-on examples of what they are and how they work.

Option 2 – Tallinn University of Technology (TTU)

An organised bus will take you from Ülemiste City to TTU where you will see different testing labs, meet with university start-ups, visit the Mechanical Engineering Faculty and the Innovation and Business centre Mektory:

3D Scanning Laboratory, Autonomous Systems Laboratory, Laboratory of Powder Technology and Metal 3D Printing, 60 kW Circulating Fluidized Bed Combustion Test Facility, Ventilation Lab "Club Fresh Air", SmartLab, 3D Printing Innovation Lab, Electronics Lab, Metals Lab, Space Centre, Cool Tool Studio, Logistics and Supply Chain Management Innovation Lab, Mobile Services and Media Lab.

The seminar and site visits are free of charge but registration is required.

Welcoming Note

President Toomas Hendrik Ilves, President of the Republic of Estonia

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Welcoming Note

His Excellency Christoph Eichhorn, Ambassador of Germany in Estonia

Industry 4.0 Implementation and Qualification at Festo

Dipl.-Ing. Mathias Schietinger, Head of Global Solution Center, Festo Didactic

As we move towards Industry 4.0, communication and engineering standards are absolutely critical. As the market leader in intelligent field automation, Festo works with all the major associations involved in Industry 4.0 and is also an advisor to the German Federal Government.

What does flexible automation mean for Festo?

Flexible automation comes down to four key elements. Firstly, it's about versatile facilities which can be modified and changed depending on the demands of the market and production. Secondly, it's the intelligent subsystems and components important for building such versatile facilities. This leads to the third important feature which is 'Plug&Produce' to speed up the re-configuration of production systems. Lastly we need flexible logistics solutions (autonomous robots for example) to connect the facilities, rigid logistics solutions won't cut it anymore. That's flexible automation for Festo.

Do you have any examples from Festo's production plant?

We already have collaborative robots operating at our biggest facility in Scharnhausen, these robots can be utilised in a very flexible manner. Another example is a highly automated assembly line for pneumatic valves. There is a trend of customizing sets of valve terminals and we have thousands of customised variants. Thanks to our new assembly lines the production is very flexible and can produce several hundred different valve types in a way that no re-programming of the machine is required. We only need a handful of parameters and self-recognition by the machine depending on the raw materials. This is a huge contribution to the flexibility of automated systems which is necessary for small lot sizes.

These production lines are purchased and build outside, but all the specifications are provided by Festo.

What is the technology behind Industry 4.0?

There are numerous technologies behind Industry 4.0. Networking and highly sophisticated data technology (broadband and high performance networks/IT communication) is probably the most important one. This is what we consider as the basis of Industry 4.0 as the amount of data and network components require very powerful and secure networks. There is always the possibility of a virtual attack hence IT security is also a big issue here.

Another important factor is standardization, the intelligent subsystems can only work if all the standardization work is done properly. The semantic issues of communication between the subsystems must be solved beforehand otherwise we can't speak about real plug & produce systems. It's a long journey, we need to take bigger steps in that direction in order to achieve our vision of a plug & produce factory.

Does it come down to technology or the people, standards and agreements?

Standardization is key here because, from the technology side, the performance of the embedded controllers/computers/network is already a given. However, it makes no sense if there is a lack of a common language between all the subsystems. Take the OPC-UA subsystems for example, Industry's RAMI guide has very clear markers for the standardization of Industry 4.0 components. The technology is more or less present today, but security and standardization continue to be the two main issues.

If we look past the technology and turn to the staff, what kind of qualifications are required to survive in this world?

We need to distinguish between two fields. One field touches upon the technical qualification i.e. the know-how for different technologies (communication networks, security, embedded systems, problem solving on a technical level, etc). This is what we have to bring to the mechatronic workers and people dealing with the networks.

On the skills level we need to focus on problem solving strategies and the work in disciplinary teams. All the subsystems have a lot of communication and data is constantly being transferred, hence the mechanical people have to speak to the software people and so on. It's an interdisciplinary environment.

The technology is more or less present today, but security and standardization continue to be the two main issues.
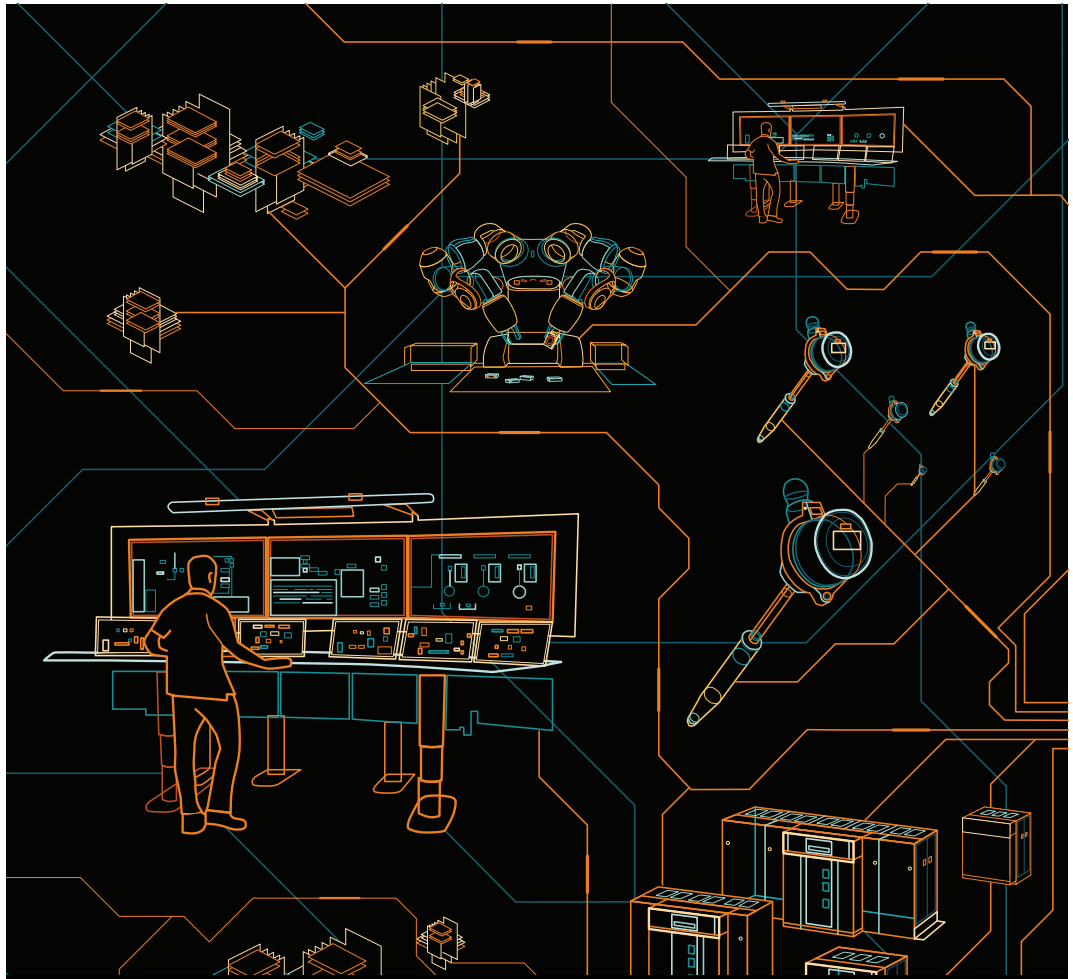
Driving productivity and efficiency globally through the IoTSP*

* IoTSP – Internet of Things, Services and People

Power and productivity
for a better world™

ABB

The Real-time Factory in Practice

Joni Lehtonen, Industrial Internet Program Manager, Tieto

Whether you are looking for optimised production, better workflow, savings in maintenance or new service opportunities, there are many ways in which the real-time factory can boost their operations.

What is Real-time factory in Tieto's definition?

Real-time factory is a new concept which will have a fundamental impact on production planning as we know it today. Traditionally there has been an initial plan, followed by going through the details of scheduling and ultimately the execution. For some reason we tend to expect that the actual execution will always go as planned but every factory worker knows that the moment the plan is released something starts to go wrong (material shortages, sick leaves, problems with machinery, etc). The plan is never accurate.

Real-time factory reinvents the old concept by collecting real-time data during the execution of the production by integrating the production machines and introducing a user interface. The interface allows factory workers to report on the current status of production through a customised platform. Our real-time factory is able to reschedule production once the original plan starts to fail for whatever reason. To conclude, real-time factory provides a bottom-up, real-time continuous scheduling option for discrete manufacturing and assembly operations.

Do you have any practical examples of real-time factory implementation?

Orfer, who is sharing the stage with us at the conference, is a great example. Another manufacturing company in Finland is just about to implement the concept in their production. We have solid evidence of the benefits that real-time factory can offer, a remarkable reduction in lead times for example.

To put it briefly, machine management is connected by a single comprehensive platform?

Exactly! All the new machines can be connected and old ones readjusted. Companies are not eager to invest into new machinery hence readjustment is key here. By bringing the machines and humans into the same platform time and inventory are replaced with information.

In this integrated manufacturing process how are you able to cope with the challenges around data and network security?

We have two different approaches in real-time factories. We can employ a Cloud based distribution however companies are not willing to open their networks to the public hence we have developed a custom platform called 'Factory in a Box', which can be directly implemented in to the factory facilities. Factory managers and production planners are able to monitor production results from their home. This data is strictly read-only though, none of the parameters can be changed outside the factory.

Each year Europe's biggest industrial exhibition is held in Hannover. This year there was a lot of talk about Industry 4.0. I was discussing our concept with IBM and explained how further analysis components could be easily fitted inside the Cloud. The guys from IBM nodded their heads as a sign of agreement.

I saw a couple of real-time factory type start-ups in Hannover but our open ecosystem thinking really sets us apart. This type of open approach can bring the competences from different vendors under one roof, which is clearly the winning formula for the future.

The open approach is actually the reason why we are here in Tallinn together with Orfer (a robotics and automation company) and Kemppi (a welding company), to show that the future factory shop floor is a combination of multiple machines and multiple IT technologies. Hence, there is a desperate need for an integrator who collects best of breed niches and knits those in to a unique net.

By bringing the machines and humans into the same platform time and inventory are replaced with information.

Process Automation Re-engineering

Urmo Sisask, CEO, Hyrles

Increasingly the Industrial sector is impacted by the Industry 4.0 concept. Hyrles is one company who has given the matter due consideration, setting an example for others with their experience and distributing necessary information to those interested. At the moment Hyrles are involved in a project aimed at digitising business processes and making them traceable online.

What are the projects your company is currently involved in?

In a wider sense one could say it is a project for company improvement, by digitising business processes. Our terms of reference were, above all, to attempt to minimise the time consumed at every step, from request for price quote to the delivery of goods. Our overall aim was to shorten the full process spectrum.

Right now the most time consuming part is the preparation period. When it comes to just the production we are way more efficient —over time we have focused on production processes and made these more effective. We are 100% utilising ERP and LEAN manufacturing is at considerable level. The overall idea behind launching the latest project was to make us even more competitive - how to expedite processes and make the system more effective from order placement to production. In a way it is a bigger thing than launching a new product, in fact for many manufactures it is a matter of utmost importance. In an essence our goal is so called double speed, i.e. we are planning to cut the time wasted by 50%. Naturally we have involved the supplier and all post production logistics in this.

As a result of this research can you already see what you are about to change? Adjustments to processes, decision

making and supply chain management for example?

Firstly we'll have to change the attitudes. When there's an engine gearing up in your head, tweaking the way you think, we can consider that to be the first stage already. Then you'll start to look for solutions. One thing is a pure software program or solution, another important thing is to transfer this way of thinking to other people, so all the others will start to think similarly. We have involved all department heads and key personnel, making sure they'd share our conviction that we are on the right track. In turn they have come up with solid ideas.

Today we are utilising an effective ERP system, yet in our sales we are still also using MS Excel. If would be great to be able to link these systems, allowing data already entered in Excel to be transferred to the ERP system in one click. Entering data to a system takes a lot of time so it should be automated somehow.

There are so many auxiliary software programs used in the production processes the main issue there is how compatible are these programs. It is important to track the equipment utilisation factor in manufacturing - we want to know what is going on at any given moment. Ideally it would be possible to use just one click to follow which machines have stopped and the reason behind that, for example one machine is undergoing a software change, another maintenance, a third is broken, etc. This way you can keep your finger continuously on the pulse so to speak and giving the chance to make the right decisions about when something needs to be changed. There are all kind of software programs supporting this kind of traceability, the important thing is to link these programs with the ones that are already in use.

In a way we have it easy as all our equipment comes from the same manufacturer, although there are some exceptions. Many companies use equipment and technology coming from various manufacturers, mainly to keep the options open. We too would rather not be overly dependent on one and the same machinery manufacturer as this way we can generate competitions in procurement. The problem is that the more equipment you have the more complicated it becomes to prepare the software. Different machines fail to 'read' each other. In a way it is similar to the mobile phone chargers, different manufacturers and models have different connectors. Today we have two technicians who can serve up to ten process units, however if these ten would originate from say three or four manufacturers we'd need at least five or six technicians.

An excellent idea is that all the data does not have to be contained in one system, the important thing would be to make the different systems communicate. In addition, we are hoping to avoid a situation in the office where one person has too much critical information and therefore becomes irreplaceable. It should be easy to replace an office employee and all the information contained in their head should be contained somewhere in our system so the replacement would be able to do all the necessary planning in just a few clicks. The job transfer would be so much easier this way, we are eagerly

awaiting solutions for this.

The human factor will remain however planning processes could be automated a way better compared to their present state. Right now we have a situation that when a key person falls ill we'll have a problem. The work will not remain undone of course however the ill person cannot recover in peace as the others keep phoning them at home asking for tips on how to get things done. It is not an ideal solution, they should be able to remain at home and recover in peace.

Industry 4.0 is not just about machinery and equipment, there are also people involved. We know some companies who have shelled out on remarkably expensive machinery that will remain untouched for months as the company can't find an employee able to operate these. Buying machinery is the easy part, you also have to consider the person(s) who'll be able to do something with it. Another hazard when it comes to purchasing new equipment is impulse buying. Only later does it become clear that the buyer lacks the know-how required to operate that machine and be productive with it.

Another major issue we are facing is a situation when you visit the Hannover fair and see all these magnificent and innovative machinery manufacturers then find that they do not have representation in any Nordic countries (not to mention Estonia). We cannot be blinded by that smart installations and computerised operations world, where the promise is that they'll perform the machinery maintenance remotely over Internet, it is just not possible. You cannot use Internet for everything, there are a number of things that can be performed electronically yet there is still a lot that requires physical presence (i.e. how tightly one should fit a screw).

At Hyrles, your concern is that the machinery would be coupled with trained workforce?

Yes, we have a qualifications exam guaranteeing that a person would already know something before they start to work. We'll also check how much they have managed to learn, we perform this exam at the end of the trial period or first year of employment.

The maintenance of equipment and installations is secured by a maintenance contract and program for preventive maintenance. There are two sides to it – one is the preventive care contracts with the manufacturer and the other is the people who are responsible for certain units and equipment, who are able to operate certain equipment.

Today we do not have a particular need for a maintenance manager, it is sufficient that the operator of each workstation is responsible for their station. We seek to develop in-house repair and maintenance skills so the operators of workstations will be more capable. Day-to-day maintenance and care, as well as scheduled check-up's, are particularly important. I have to admit that Estonian enterprises display remarkably varied levels in this respect, I'd venture as far as to claim that we

have been rather successful in this. We invest into fine tuning the equipment, into cleanliness and personnel wellbeing yet we are often in competition with enterprises who could not care less. We believe that customer awareness in these matters keeps increasing and soon they'll start to appreciate what we are doing.

In conclusion, the main principle behind implementing Industry 4.0 in Hyrles is to streamline processes, making them shorter and more transparent. The overall aim is to generate more with using less.

The overall aim is to generate more with using less.
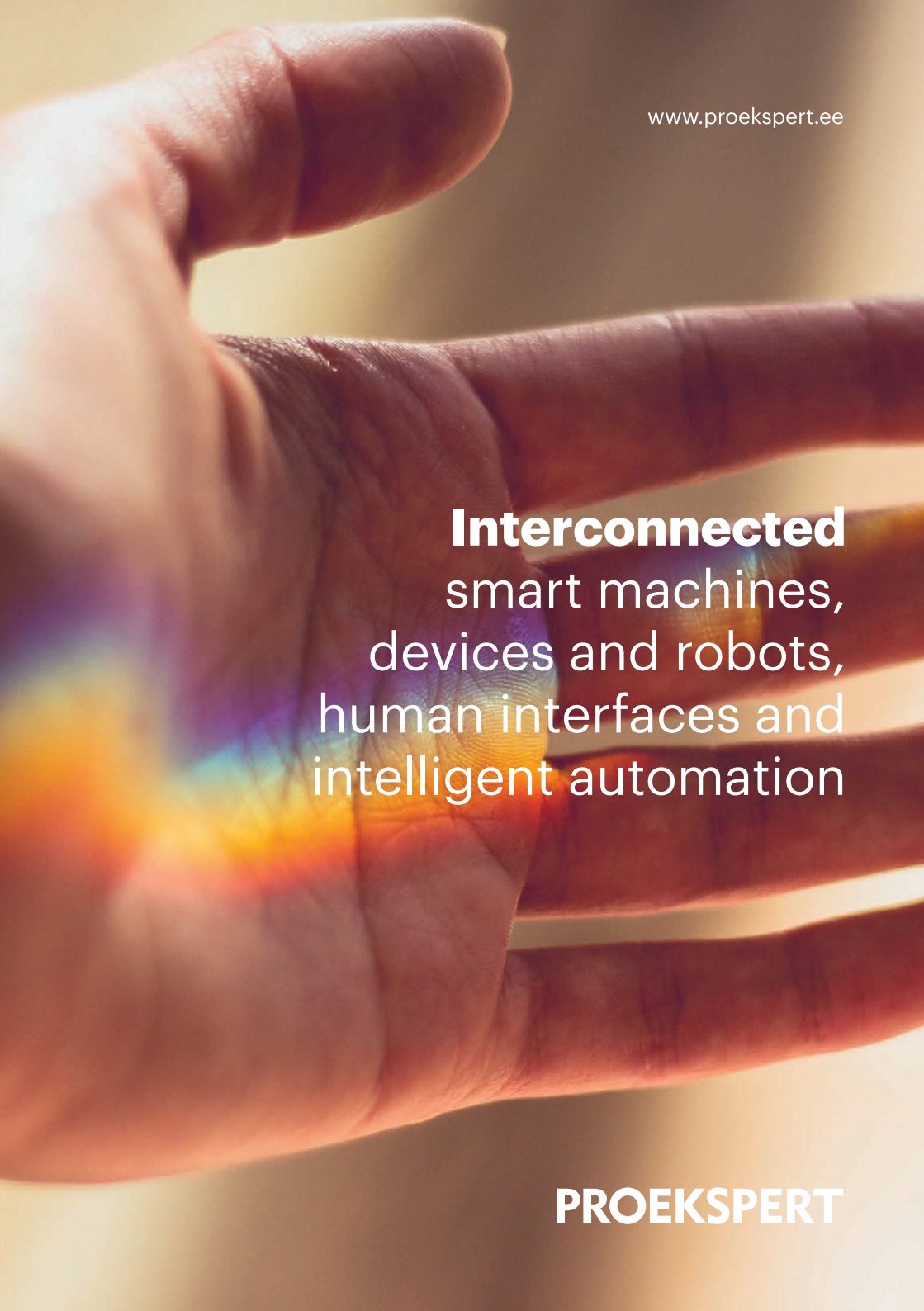
Interconnected
smart machines,
devices and robots,
human interfaces and
intelligent automation

PROEKSPERT

Hack the Industry!

Petri Vilēn, CEO & Co-founder, Industryhack
Matti Uusivuori, Software Specialist, Nortal

Industryhack is a series of hackathons, bringing startups, coders and designers together with industrial companies to develop new products and services for the internet of things. Industryhack opens big companies' doors for hackers to develop new products. The host gives access to exclusive data and resources, and brings in their industry experts to help.

How does hackathon fit into Industry 4.0's context?

Petri: Industryhack's hackathon focuses on resolving a single customer's challenges. Industryhack is a good place for a company to find long-term partners for innovation and the technologies which could be utilized into the host's ecosystem. We're talking long-term partnership and problem solving.

Our customer Konecranes is a good example. The company used to be focused on developing cranes. At one point they came to an understanding that their cranes need to 'communicate' with the surrounding environment (ports, warehouses). In order to top-off the cranes they need to provide new services

and develop fresh business models. This cannot be done only internally, and requires opening up to innovation and cooperation with external partners. Industryhack has become a good platform for that.

Our events can be considered exclusive. We screen the applications and only take in a limited number of applicants, usually about 25-30%. In each hackathon we have roughly 12 teams consisting of professional software developers and start-up companies. All of which are willing to continue their work with the host after the event.

Matti: As a software company we are interested in entering the host's ecosystem to analyse the existing

PETRI VILEN

processes and tackle the challenges by automating company's processes with technology. The goal is to bring more value to their business by reducing costs and increasing efficiency, also finding new business models. IndustryHack is a great opportunity!

Have you heard of similar practices anywhere else in the Industry?

Petri: At the point of launch, Industryhack was very much a new concept. Sure, there are some individual hackathon events, but so far we haven't found anyone who does industrial hackathons as extensively as we do. We've facilitated 12 hackathons with large industrial companies and continue to grow the pace starting this autumn. This concept is improved every time and seems to be working pretty well; all sides are benefitting.

Can you tell a bit more about Gasum's and IndustryHack's open innovation competition "Hack the Gas"?

Matti: Aim of the hackathon 'Hack the Gas' was to develop new concepts for e-learning and create services for energy production, industry, homes, and transport by making better use of the data collected. Our team won the hackathon with solution 'Fill it Up', a mobile and smartwatch application that makes paying for gas easy and fast. It was a very interesting experience from the get-go. What might be surprising, is that a lot of the work is actually done beforehand. We interviewed Gasum's

employees and customers, brainstormed and analysed within our team to develop the best solution, built prototypes and demos, filmed videos, rehearsed the pitch and much more. It's a challenging journey.

Petri: The competition was based on Gasum's gas network and consumption data, and organised at their main hub in Kouvola. Gasum is a good example of a company that has a clear innovation process. They evaluated the outcomes of teams, and continued discussion with most of them about further projects.

It sounds like a rather lengthy process. What's the timeline for such hackathons?

Petri: The organization process usually starts 2-3 months prior to the actual event. Our first task is to define the challenges on which we should be focusing at the event. We spend a lot of time with the company in order to locate their problems and opportunities for digital solutions. After this, we're able to lay down the outline for the hackathon and open applications. The application period lasts 2-4 weeks. Once the applications have been screened, teams are able to register and receive data 1-3 weeks before the event. We are really focused on involving the host company's staff. It's a big crowd! We had 20 people from Gasum and 40 from Konecranes. They work closely together with the teams. We also have coaching available at the event. They're helping out with development and the execution of the final demo. These demos are presented on the last day. The host company's C-level jury then makes the ultimate decision and announces the winner.

MATTI UUSIVUORI

Could you share some practical outcomes of your hackathons?

Petri: For example, the biggest recycling company in Finland Lassila & Tikanoja recently launched a web service that combines sharing economy and waste recycling, named Kimppanouto.fi, which was initially developed at Industryhack event they hosted. The product was launched as beta in January, has been developed iteratively based on customer feedback. It has been successful and became a part of Lassila & Tikanoja's portfolio of digital services.

Another interesting solution was developed for Konecranes, one of the world's leading crane makers. A team came up with a solution where heavy expensive crane controllers are replaced by much cheaper smartwatches. This was developed into production-ready product in 2,5 weeks after the event. On the other Konecranes hackathon we saw the birth of a maintenance platform Machinebook, which helps to follow the status of their thousands of connected cranes around the world. The team has now developed it into a real product and have been offering their Machinebook to other companies as well.

Ponsse produces forestry machines. One of the winning teams at Ponsse's hackathon developed an interesting dashboard that gathers data from the machines and converts it into useful information about the driver's performance to fleet managers. The prototype already brings value to their customers and Ponsse looks to continue to work together with this and several other teams as well.

Matti: In case of 'Hack the Gas' hackathon, the challenge with natural gas and biogas as transport fuel is its obvious lack of popularity in Finland. Currently there are only around 2000 natural gas and biogas cars driving on the roads in Finland. Our main idea and goal was to demonstrate how we can help Gasum grow the popularity and use of this alternative fuel.

In development we focused on 4 things: ease of payment, ease of finding the nearest refuelling station, notifying customers about maintenance breaks and highlighting cost savings as well as environmental gains of using natural gas and biogas. Our solution was called 'Fill it Up', a mobile and smartwatch application that makes it easy for customers to pay for refuelling without even using one's wallet. We also developed functional prototypes that helped to navigate to the nearest station, and based on refuelling data, we developed UI prototypes to show costs saved by using natural gas instead of using gasoline.

The host companies are putting themselves in a very vulnerable position. Do you see any threats in terms of privacy and security?

Petri: There are certainly threats to be considered. The companies are usually opening up their innovation process for the first time. They are worried about open data, business critical information, etc. On the other hand, they have already accepted the fact that sharing this information will be essential in order to develop new products and be on top of

the competition. Many of our customers have been blown away by the amount of great ideas produced in just 3 days. The competitors might be developing the same concepts just as fast. It's time to experiment and open up to new technologies. The great outcomes are luckily overruling those fears around data.

It's time to experiment and open up to new technologies.

Platforms for IoT and M2M

Toomas Kärner, IoT Area Manager, Telia Eesti

The Internet of Things, or IoT, is already having a major personal, social and business impact. It enables radical innovations and totally new services that either change businesses or transform entire industries. Today's IoT growth is due to a combination of business motivation and technological maturity.

IoT can solve a wide variety of challenges. The main value is in getting data from the physical environment to the computers and making better decisions based on that. IoT is inevitable because the connectivity cost and cost of the devices is going down. Before, the data had to be very valuable in order to put sensors into the field, the investment had to be bulletproof. Now, with device and communication investment costs going down, everything becomes cheaper and sensors go everywhere. You start getting efficiency from previously untouched areas where the ROI used to be too low.

Are industries already realising this cost reduction or is it the technology side pulling them out of these old myths of expensive data?

It works both ways. There are good examples from the industries' side and many have implemented IoT technologies to improve their offerings to the customers. There are also examples of technology pushing industries. An industry itself has to jump on board in order to take advantage of it. Obviously the best examples are global ones, big manufacturers receive real-time data and move towards service-oriented operations which can secure long-term revenues.

We've heard about 5G coming along soon. What kind of possibilities does 5G open for industrial production?

5G opens up a very important area. So far we've had problems with devices

that are not connected to power by a cable. Connecting these devices was very problematic since you had to build a local radio network whilst dealing with a power constraint. 5G comes with a new set of functions designed to tackle these challenges, it offers limited broadband connectivity but the radio side is much cleaner. We are talking about up to 10 years of battery life - you can build the device, put it on and forget about it.

Within ten years the technology will evolve too anyway. Now it is time to start thinking about putting sensors into the asphalt when you're building roads for smart cities for example. When it comes to the cost, the targets for the chip manufacturers are already below $10 therefore the device is cheap and will last for a very long time.

Are there any practical examples of successful implementations?

There are no examples when it comes to 5G yet, it's still on the lab level. 5G focuses on two areas: narrowband and long battery life. These two are almost ready for use. Then there's the high bandwidth area, which is under heavy development at the moment, especially in South Korea who are aiming to use it for the 2018 Winter Olympics. They have a clear deadline.

Sure we can start developing cases for 5G usage, but some of the hurdles that we are experiencing will be removed by the time 5G will be launched. In Sweden Telia has announced a new product coming to the market called Telia Sense. It's not necessarily a fleet management

product but a personal connected car experience product. There are similar trials happening in Finland with a product called Sonera Matkalainen. They are also testing features where the consumer is able to track his/her car and receive insurance benefits depending on their driving style etc.

What is the biggest challenge for IoT in the coming years?

There are two major challenges. Firstly, how are we going to survive the hype? There is a lot of hype at the moment, a lot of rushed investments. Market consolidation is inevitable at some point and it will bring bitterness for those who failed. It raises the question, how do we choose the companies and products who can actually create value, an economic benefit beyond just hype?

Another issue is related to data privacy and inter-operability. Can we build a world where everything is inter-operable? Will I be able to connect my device to the IoT and not be forced into choosing between Apple and Google? Thus far it hasn't been a huge concern for big industry because they operate in closed networks but it will become an enormous issue once they reach consumer environments.

How to make data and devices work together? Are there any movements within the Telia group to influence standardization?

There are different bodies within Telia group who are trying to agree on standards. We are also currently trying

to find solutions that can be accepted by multiple external parties. It has to be something which will receive traction from the developer communities because nowadays the most successful projects depend on finding the best developer. Telia is trialling different technologies and pilots both abroad and in Estonia, we have a project in Tartu for example.

Luckily we have good relationships with other players in the Telecoms sector, there is great understanding across our sector. Back in the day telecoms connected us via a cable or wireless but now the connection has become logical: ensuring it all works together. You don't need a Samsung phone which can only communicate to other Samsung phones.

Once the standardization problem is solved a start-up can easily produce killer products in smaller countries. Language becomes the only barrier for developers. This in turn will bring prices down for the companies interested in these innovative products.

The main value is in getting data from the physical environment to the computers and making better decisions based on that.

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Value for life

Uber and AirBnB takeaways for Industry

Toomas Talts, CEO and Founder, Codeborne

Uber and AirBnB are often held up as remarkable case studies on the potential of growth hacking. As a result there are a number of different lessons for entrepreneurs to take from Uber and AirBnB's success.

What was the key to success for AirBnB and Uber? Are there any lessons which could be applied to Industry 4.0 based on these examples?

AirBnB and Uber can be defined through sharing economy. People have idle resources at their disposal, in AirBnB's case it is a flat or house you don't use at all times. Why not rent it out to others? Replace the word 'flat' with 'car' and you get Uber. Instead of watching TV and drinking beer you can spend your free time driving and make some extra money on the side. You're squeezing out that extra penny from the resources you already have and there is no need for any substantial additional investments.

The same demand-response management could be applied to the electricity or electrical appliances we have in our homes/factories/offices and generate extra revenue for the owners. It's up to the industry experts to identify these idle capacities.

Are all industries equal when it comes to idle resources?

It differs from industry to industry however there are interesting examples from across of the spectrum. Let's take a sawmill, a very self-explanatory business. The log goes in, gets chopped up and that's the end of it really. No idle resources there. But once you reach the actual processing stage you'll probably be using big drying houses with huge containers and specific temperatures, which means you are obviously using electricity for heating. Here is a possibility to participate in the demand-response market, decreasing your consumption if

the same capacities are matched on the electricity market.

I have a similar case with crude oil terminals in harbours. The pipes connecting the two oil containers need to be heated during the winter because crude oil has a tendency to get too thick. The demand for electricity is dictated by the weather.

In the end it's not only about electricity, it's applicable for almost every type of equipment. Maybe we could share this equipment with start-up companies who might occasionally need those resources? Once again, it's up to the experts to allocate these possibilities, my aim is to motivate industry experts to unleash the creativity within.

It is important to note that there is a financial rationale behind the demand-response model. Nobody does it for purely ethical reasons, it's a direct response to the current world economy, everyone is counting money. I will touch upon the ROI aspect as well, afterwards people in the audience can do the math for themselves according to their capacities and whether they would benefit from this model.

When it comes to Codeborne, at this point of time we can't really report on anything which is fully functional. The first prototype is now ready and works in simulation mode. I would love to cover our work as well, it might be a grey topic for the audience but I will try to make it as real as possible.

It is important to note that there is a financial rationale behind the demand-response model. Nobody does it for purely ethical reasons.

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Intelligent Tool Monitoring Systems

Karel Kask, Head of Sales, Nordic Automation Systems

What do we know about intelligent tool monitoring systems? Nordic Automation Systems' hardware and electronics focus on maximizing efficiency and optimizing daily processes through careful analysis of consumption data and details of tools and machinery usage.

How does Nordic Automation Systems define Industry 4.0?

Nordic Automation Systems doesn't scale Industry 4.0 down to automation and robotics. We are able to analyse the consumption data for all the tools and machinery and give feedback based on the results. The work process becomes more efficient as a whole. Our sensors measure trigger time and the consumed air or energy of each machine in real-time. Afterwards there are tons of possibilities for the companies to improve their everyday work processes. Measuring the exact consumed energy and trigger time used for a certain process allows the company to evaluate results and make adequate conclusions based on the data. Knowing the core data is key to reducing production costs and making efficient use of tools and machinery.

Predictive maintenance is another key element in Industry 4.0. Our sensors provide the possibility to assign each tool a customised service task, anything from a simple cleaning process to a part exchange. The person responsible for the equipment will be notified when any of the tools need to go through maintenance. The whole maintenance cycle can be taken under full, visible control, which significantly prolongs the lifetime of the equipment. Analysing consumption info and the lifecycle of each tool will also give a clear overview of the most efficient devices, improving purchasing decisions in the future.

Industry 4.0 is also very much about improving safety in workshops and here measuring the exact trigger time is helpful.

We can measure the vibration which each worker is exposed to and warn the employer once critical levels have been reached. With that we prevent one of the most common occupational disease's in factories and workshops – Hand Arm Vibration Syndrome (HAVS).

When it comes to actual optimisation we have a solution called compressed air management. As factories know, compressed air is a very expensive source of energy. Air compressors are prone to high leakages and pressure drops due to various physical factors - connector spots, tube convergence, surface roughness, etc. This air is not monitored or optimised in any way. Our pneumatic sensors can measure the air pressure in different locations and identify any drops in pressure, the system then optimises the amount of air compressed hence decreasing the leakages and energy consumption as a whole.

Which industries are you referring to?

We are talking about any industry using pneumatic solutions or air-powered, electrical or battery tools. We don't have a strict definition when it comes to our customers however we are mostly working with workshops/factories using 50+ tools in their daily work otherwise it doesn't produce the best effect.

We've recently added the construction industry to the list as Nordic Automation Systems also offers theft prevention and presence monitoring of tools. The construction company is usually operating across several sites so you can imagine the amount of tools they are using

daily and having no overview of these valuable assets. Our real-time inventory management can identify whether each tool has reached storage by the end of the day, in which status and the usage statistics in general.

In terms of optimising the work process, can you share any examples of success?

We have a partner in southern Sweden who deals with sewage and water solutions. They are using nearly 6,000 pneumatic tools daily and work in 3 separate shifts. Firstly, they are able to analyse the trigger time and the amount of energy consumed for manufacturing each detail i.e. how much does it really cost to produce one part. If you do 10-15 of such details in one working day you can easily analyse the points where the most energy is expended. The user can then optimise their processes and make every process equally efficient.

The predictive maintenance side is very important as well. There is one person responsible for all services in the factory, he receives a weekly overview about the exact location of the tool and its current condition. The savings are significant.

You mentioned occupational safety, can you elaborate a bit?

People working with vibrating hand tools are at risk to a health hazard called Hand-Arm Vibration Syndrome. It's widely spread in countries where manufacturing plays an important role, the UK and Germany for example. By measuring the

exact vibration and trigger time for each tool we can notify the worker when he/she has to wear additional protective gear or finish their work day altogether, the EU has very strict directives here.

You're mostly talking about big manufacturing businesses. Is any of this actually affordable for SMEs as well?

The key factor in producing these sensors is energy efficiency - our solutions become controversial if the sensors are consuming too much energy. The sensors' pre-charged battery can last up to 3 years. We approach each customer personally, evaluate their needs and present a suitable offer. Moving forward it is likely that sensors will become more affordable as the prices for electronics drop.

Knowing the core data is key to reducing production costs and making efficient use of tools and machinery.

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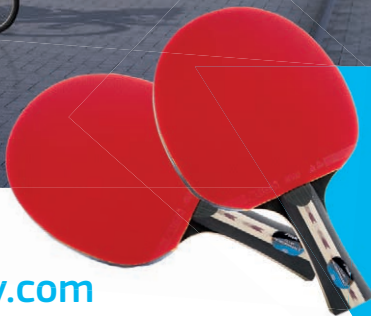
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ABB – Connected Asset Lifecycle Management

Peter Kavanagh, Business Solutions Consultant, ABB Enterprise Software

As the only industrial enterprise software solution provider with a combined IT/OT offering, ABB and their select partner ecosystem work seamlessly to execute best of breed solutions for the most critical business objectives. Over 1,100 asset-intensive companies globally trust their solutions to keep the lights on for the world's largest cities & venues, predict asset failures to ensure reliability for millions of rail commuters, and align mining production and operations resources in pursuit of their commercial strategies.

What are the key trends in the maintenance industry?

Time based maintenance is slowly being replaced by predictive maintenance. In the old days you would have done a maintenance check on your car every 10,000 km. Nowadays with predictive maintenance the car itself, or various parts on the car, will indicate the correct time for maintenance. The process becomes much smarter.

Various studies have suggested 60-70% of time-based inspections can be unnecessary and these extra inspections can often lead to issues with the asset. ABB's smart technology enables real-time information to fed about an asset's health. It's a connection between the asset, the back-office and field technicians who will perform maintenance on the asset.

Therefore ABB allocates its resources i.e. field operators in a much smarter way. Is that the main benefit?

Undoubtedly this is one of the key aspects when it comes to predictive maintenance. Catastrophic failure of a transformer is 3-10 times more expensive to replace than getting early warning signs and calling out a field crew to investigate. Apart from receiving a more efficient deployment of the crews, with smarter

maintenance the majority of time based maintenance will become unnecessary, thus saving time and reducing costs.

I assume part of the information goes back to product development, the logs can be fed into the bigger system, which in turn becomes much more efficient?

ABB, as a transformer manufacturer and provider of global transformer services, has investigated over 10,000 failures, or partial failures, of transformers from many different manufacturers. The insights we've gained are used in a sophisticated algorithm to determine when healthy transformers are showing signs of future problems. Naturally the insights are also used to help us improve the way we build transformers. As these new systems come online they provide much more information, which we use to improve both the algorithm and products further.

Is this an in-house development for ABB devices or are you extending the usage far further? What role does ABB play here?

ABB Enterprise Software has been developing expertise in asset management for more than 35+ years. ABB on the manufacturing side, in addition to being a leader in primary equipment, is also one of the leaders in developing smart embedded sensors for its products and a major player in the Internet of Things, Services and People (IoTSP). These sensors and the ABB asset health solution work across any manufacture's equipment.

Usage also extends far-far further and the asset management software is deployed globally across Utilities, Transport, Mining and Defence industries. The asset health potential is there for any asset intensive enterprise with pressure for higher reliability and control of costs. For asset types where ABB does not have the historical asset knowledge we will partner with external companies who do.

Do you have any measurements regarding the impact of this new technology (increased productivity, efficiency, employee safety, etc)?

There are various studies available that look at the impacts of moving to predictive maintenance. In one study the reduction in unplanned and catastrophic failures was about 70%. ARC Advisory Group has estimated, based on discussions with their customers, that unplanned downtime can be cut in half by moving from traditional time and usage-based maintenance. The biggest benefits are coming from increased efficiency in the maintenance organization, and thereafter savings resulting from the reduced failure rates.

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Switch it on! Plug it in!
Make it smarter!

JAAN MURDLA
Industry Expert at Helmes

Industry 4.0 is a very interesting challenge and full of opportunities for the IT-sector. There are many companies in the Estonian IT-sector who are prepared for it; one such company is **Helmes**. The main field of activity at Helmes is the integration of business-critical information systems, which in essence is one of the main components of the Industry 4.0 concept. But it also includes bringing all industrial appliances into an integrated information system, the so-called 'Internet of Things', in a company.

A step forward is the development of management algorithms, which an appliance can use to 'understand' whether it can start working on a task or whether there is an obstacle present (a missing piece of raw material, tool, etc.); it will then look for the next achievable work task on its own. Developing such algorithms can be a fascinating challenge.

The preparedness of industrial enterprises to go along with the Industry 4.0 revolution is perhaps smaller, but this nevertheless should be not excluded from the long-term strategy. Information society is developing ever faster and, I believe, success in the future belongs to those companies who are prepared to open their information systems to customers in a way which enables the latter to track the status of their orders online. This requires that companies have a very strict and disciplined inner business culture.

I think that already in the near future we will see company equipment labelled '**Industry 4.0 compatible**', although the real nature of such a label requires the development of appropriate standards. In order to integrate equipment into the system today, replacement methods and opportunities need to be used, and Estonian automatics- and electronics companies can offer relevant support.

The discussion about the 'Industry 4.0 compatible' label has already been initiated in the world, but here we have the typical chicken vs egg dilemma – equipment producers are hesitant as to whether there should be a demand or a supply in the first instance.

The ICT sector is perhaps unsurprisingly the most ready for this; equipment suppliers detect an opportunity and industrial enterprises are only just beginning to learn about the topic. The development of a standard requires input from all parties, but it is difficult to predict how long this may take. I would draw a parallel with the colourful world of mobile phone chargers before micro-USB came along, though we can hardly approach the issue of Industry 4.0 in such a black-and-white way.

Industry 4.0 has yet to dramatically transform the face of industry or IT, but I see the rise in awareness and interest. The movement has begun. We can sum up the topic with three sentences: 'Switch it on! Plug it in! Make it smarter!'
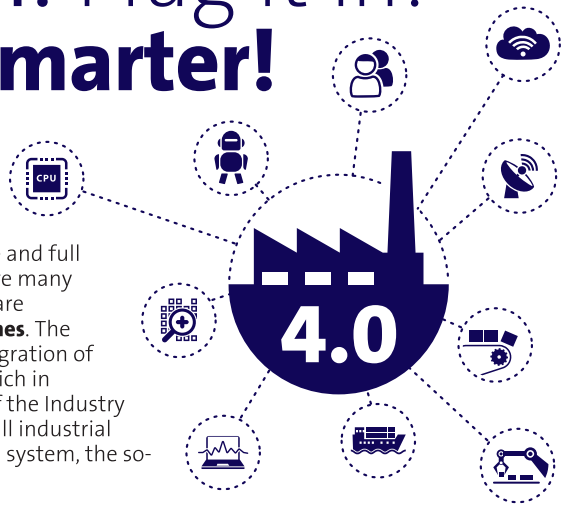
Digitalisation of the Supply Chain – The Intelligent Box

Bo Gunnarsson, ICT Manager, Ericsson

5G will enable new functionality for people, society and enterprises. 5G is the foundation for realizing the full potential of the Networked Society. The new capabilities of 5G span several dimensions, including tremendous flexibility, lower energy requirements, greater capacity, bandwidth, security, reliability and data rates, as well as lower latency and device costs.

Last year your colleague from Ericsson, Janne Peisa, talked about 5G. What have been the key developments during this last year?

To begin with, we've started to develop a second generation of 5G test beds with beam steering and trace and tracking capability, recently demonstrated at the MWC in Barcelona. We are looking into a couple of new higher frequency bands to enable the technology, one of them, the 4GHz band, will be used for the 5G trials to be set up in Estonia. Surely we still have a lot of things to evaluate, but we're taking big confident steps.

Have you modelled some business cases where 5G will start to make significant difference? Please give some examples.

To be honest I am not that concerned about specific business models. 5G enables us to connect things instead of simply connecting people. We have now reached a point where a lot of devices can be connected to a single radio base station (essentially IoT).

5G can be run in different modes. For example, narrowband communication allows us to save a significant amount of energy, which in turn elongates a device's battery life by several years.

We are also talking about MTC (machine-type-communication) applications. The massive MTC spans a huge number of devices, lowers the

device cost, elongates the battery life and decreases data volumes. Critical MTC is ultra-reliable, highly available and good for low latency (the response time becomes much shorter). All of this is supported by 5G, it's up to businesses to come up with creative implementations for these solutions.

If you envision the future, what will increasing mobility mean for the industrial sector?

All industries are connected in one way or another, usually via a local network. 5G allows us to set up an independent network. A robot supplier can easily set up a personal network for all of its machines and receive useful real-time data about all the operations. They are able to manage and monitor all the machines through a personal network window.

Moreover, there's an interesting idea boiling amongst the Swedish truck industry. If you connect all the big industry players' truck's you can monitor the driving behaviour/performance across all the companies. This in turn can be used to better configure the trucks e.g. with different SW, gear boxes, etc. to support the driving behaviours and reduce fuel and emissions.

All industries are connected in one way or another, usually via a local network.

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Modular Electronics Factories

Terry London, Product Owner, Proekspert

There are millions of software developers in the world. But the world does not require software, the world requires user-friendly functionality that both looks good and serves real business purposes. This is where Proekspert comes in.

How do you bring factories in to the Industry 4.0 era?

In our vision, tomorrow's factories should resemble today's mobile platforms. Five years ago we were still buying feature phones - your selection was based on features. Now you're in charge of the building - you select a platform and the applications to go with it. The same should apply to Industrial factories.

When upgrading and assembling a factory you are mostly dependent on expensive solutions from proprietary factory line providers. The majority of Estonian factories creating custom products are operating according to the high mix/low volume model. These factories thus need to change their product directions often. A single factory line can consist of tens of machines, meaning that they have at least 3 different machine providers. The machines have limited connectivity, in order to create a complicated manufacturing execution solution every single machine needs to be integrated with the IT system, one-by-one. Replacing a device means creating all those interactions again, it's expensive and time consuming.

We on the other hand want to offer a plug-in based solution which could be shared across different factories. With this, platform factories will enter the Industry 4.0 era with a flexibility and automation in production that keeps them competitive.

Proekspert has worked with a wide range of industries, can you name a few?

Our biggest focus goes on intelligent machines and their secure inter-connection. For example, we are behind

the development of leading drives that are used in the ventilation of car tunnels in Monaco. We've also worked with other, traditional industries like food production.

We focus a lot on electronics assembly at the moment is because this is one of the most demanding industries. ODMs are eager to use the fastest and newest machines out there. Other industries are moving in a similar direction but rely more on human workforce and older equipment. Our platform integrates people, software and machines.

Have you actually been able to implement your modular approach in Industry or is it still at the visionary level?

We have reached a pilot phase where we are developing the approach together with early adopter customers. We have taken an open approach to speed up the time to market and are currently on-boarding new pilot customers on daily basis.

The modular approach promises greater flexibility and agility, is it the most important aspect here?

We are talking about affordable and fast adaption to change. Similar to the smartphone platforms, we don't foresee all the services and applications different developers will be creating moving forwards. The platform approach enables development of new services that will positively surprise us and our customers.

All industries are affected by the fourth industrial revolution. This increases the importance of security concerns and reliability of connectivity for factories that have so far preferred to stay offline. This mind set will change in coming years, industry is moving forward and hybrid cloud solutions will become prevalent.

Phones and factories – can these two be brought to the same level?

Factories involve a great deal of care in people, business and technological aspects. Smartphones might seem simple but they have become essential and critical parts in our everyday lives – from managing other devices to dealing with financial decisions. A couple of years ago the first real-time trading app was released, Proekspert was behind the development. When it comes to trading every split second counts and the business impact of these decisions can be large. In electronics assembly the machines are very complicated and work extremely fast, the business stakes are high so, similar to trading, there has to be trust built into the system, integrations and its interfaces.

Proekspert's software is actively used in the beer industry, why does it appeal to Proekspert?

Proekspert aims to be involved in developing products that change the world for the better and make people's lives simpler, we are always on the lookout for improving products and providing more business value. For example, for the drives behind the beer industry we are able to measure and analyse the performance of these motors and give

accurate feedback based on our findings. All these readings are extremely critical for the motor and system's health. We are driven by a passion to develop future proof solutions that free up people's time so they can concentrate on things that really matter, for example beer.

Industry is moving forward and hybrid cloud solutions will become prevalent.

INDUSTRY 4.0 IN PRACTICE

Innovation for the Future

Janne Öhman, CEO, Siemens

Global competition is fierce. The view of Siemens is that Finnish companies and manufacturing industry can succeed globally. The labour costs are not the biggest hindrance but distance from global market area is.

So, how can you succeed? The answer is digitalization.

Janne Öhman, CEO of Siemens Oy, will talk about Industry 4.0 developments at Siemens.

Estonian ICT Cluster

The Estonian ICT cluster is the main force behind ICT cooperation and development in Estonia. It's a collaboration platform for enterprises, set up to boost the development of new products and solutions, and foster their export to the international market.

Cluster partners are companies that have developed smart products and created many of Estonia's world-recognized ICT solutions. Partners' bywords are efficiency, creativity and a can-do spirit. For them, the word 'impossible' simply does not compute.
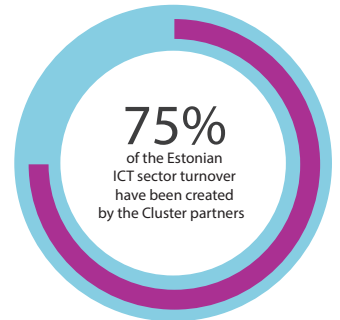
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Helmes is an international software development house with 200+ experts, 25 years of experience, HQ in Estonia and clients across the Europe and US. We focus on design and development of software solutions critical for the operation of the business. Created solutions replace work processes demanding large volumes of human work with automated and efficient processes. Systems developed by us are mainly complicated and they interact with clients' existing and new created information systems

Nortal is a multi-national ICT and Business Consultancy dedicated to providing high-end solutions for both public and private sectors. Using the proven blueprints of Estonia's critically acclaimed e-Government services, the highly efficient optimisation solutions from Finnish manufacturing and energy processing sectors and global data security best practices, we help bring about meaningful e-Transformations in societies, government agencies and private companies.

Nordic Automation Systems AS is an industrial automation development company, specialising in sensor technologies, data analysis and monitoring solutions. Our development is focused on conservation of energy, health and safety at work and all in one effectiveness. Tool Monitoring System™ is monitoring hand-tools and their usage, enabling to protect them from thefts, monitor vibration exposure of workers, assign maintenance cycles, establish a real-time inventory management and get maximum efficiency out of all the tools.

Telia Eesti is a new generation IT and telecommunications company offering wide range of integrated mobile, broadband, TV and IT solutions as well as valuable content to both private and business customers. Our aim is to further develop Estonian information society and bring the world closer via excellent connectivity and continuous innovations – on customer´s terms. Telia Eesti is part of the international Telia Company headquartered in Stockholm.

ABB

ABB is a leading global technology company in power and automation that enables utility, industry, and transport & infrastructure customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in roughly 100 countries and employs about 135,000 people.

In Estonia ABB has been operating since 1992. Today the company employs 1,300 people and covers two main fields: production (motors, generators, drives, renewables, switchgears and compact substations) and sales (transmission and distribution substation projects, medium and low-voltage products, automatics projects and robots, maintenance services for industrial customers)."

SIEMENS

SIEMENS "Ingenuity for life" is our promise to create value for customers, employees and society. Siemens delivers on this promise by combining our innovation with our know-how – in the areas of electrification and automation, enhanced by digitalization – and by acting as a reliable and responsible partner.

tieto

Tieto is the largest IT services company in the Nordics and Baltics providing full lifecycle IT services. We also provide global product development services for companies in the communications and embedded technologies arena. Through industry insight, technology vision and innovative thinking, Tieto proactively strives to inspire and engage its customers in finding new ways of accelerating their business.

Ülemiste City

Ülemiste City - the Silicon Valley of Northern Europe.

More than 300 enterprises with 7,000 employees operate at Ülemiste City. Among them Kühne+Nagel, HCL, KoneCranes, Parallels, Playtech, E-profiil. Ülemiste City is located next to Tallinn Airport and offers inspiring environment with full range of services. Ülemiste City developers are Technopolis Ülemiste AS and Mainor Ülemiste AS.

PROEKSPERT

Proekspert is an Estonian software development and design company. We are loading machines with intelligence, and mixing high-end design with the utmost usability. Our focus is on making machines and devices smarter, creating self-service environments, providing

predictive analytics, usability and design.

Tallinn University of Technology (TUT) is the only technological university in Estonia. Here the synergy between different fields (engineering, ICT, technological, and social sciences) is created and new ideas are born. The TUT campus is also a home to the Estonian Information Technology College and 150 high-tech companies (e.g. Skype).

The Estonian Association of Information Technology and Telecommunications (ITL) - your Gateway to the E-Estonia Powerhouse.

ITL is an organisation, whose primary objective is to unite the Estonian information technology and telecommunications companies, to promote their cooperation in Estonia's development towards information society, to represent and protect the interests of its member companies and initiate new innovative business projects.

The German Embassy in Tallinn is the official representation of the Federal Republic of Germany in Estonia. Close cooperation with the Estonian Government and Parliament, the business, cultural and media worlds as well as with Estonia's civil society are essential to the Embassy's mission of furthering partnership and friendship between Germany and Estonia and its peoples, bilaterally as well as in the European Union, NATO and the OSCE. Since September 2015, Christoph Eichhorn is Germany's Ambassador to Estonia.

Enterprise Estonia (EAS) contributes to the achievement of long-term strategic goals of the Estonian economy. EAS promotes promotes business and regional policy in Estonia and is one of the largest institutions within the national support system for entrepreneurship by providing financial assistance, counselling, cooperation opportunities for foreign investments and training for entrepreneurs, research institutions, the public and non-profit sectors.

Tallinn, the capital of Estonia, is a part of the economically stable Nordic area, situated on a busy trading route between East and West with excellent ports and access to 50 million consumers within 24 hours. Being nominated among TOP10 European Cities & Regions of the Future 2016/2017 by the fDi Magazine, Tallinn offers a business-friendly environment both for international companies and foreign investors.

Tartu Science Park Foundation (TSP) is a technology development and business support centre. Its main objective is the creation of favorable environment for the emergence and development of technology businesses. Currently there are 100+ companies working at the TSP premises. TSP offers business acceleration, product development and prototyping services to SMEs with the help of Buildit Hardware Accelerator (www.buildit.ee) and Protolab (www.protolab.io).

Ericsson is the driving force behind the Networked Society - a world leader in communications technology and services.

Our services, software and infrastructure - especially in mobility, broadband and the cloud - are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

Columbus' core purpose is to help organizations digitally transform their business and maximize productivity by offering innovative and leading business solutions. Columbus aims to be a leading global value provider of digital business solutions in food, manufacturing and retail industries. We aspire to keep our customers for life. We will attract, develop and retain the best people in the industry. We exceed 20 years of experience and 8.000 successful business cases, and we're proud to offer our customers solid industry knowhow, high performance solutions and global reach.

In March 2016, Columbus launched its new 5-year strategy, named Columbus2020. Columbus2020 is based on four strategic interconnected elements that lead our customers in the digital transformation of their business: customer success, digital leadership, process excellent and our people.

An essential focus area for Columbus is to ensure satisfied and successful customers by improving the value realization or their ERP investment and by helping them accelerate business innovation.

INDUSTRY 4.0 IN PRACTICE

ESTRONICS cluster is a collaboration platform for Estonia's leading electronics engineering and manufacturing companies, R&D institutions and professional associations. It is operating under the Estonian Electronics Industries Association.

WE DELIVER A FULL RANGE OF SERVICES THROUGHOUT THE PRODUCT LIFE CYCLE:

- Product design and prototyping
- NPI: introducing new products into mass production
- EMS: Electronic Manufacturing Services
- Supply chain management and optimisation
- Post-production support
- Legal counselling with emphasis to intellectual property issues
- Plastic components for electronics industry
- Professional training and business development support for commercialisation

WE ARE LOOKING FOR:

- Expand route to market for 50+ products and technologies within the ESTRONICS portfolio
- Collaboration partners with proven track records for concept validation and high-end prototyping services
- Customers for our 100+ electronics engineers, software developers, hardware designers
- R&D partnerships to market projects in collaboration to Estonia's leading research organisations
- Mass production customers from low to high volumes along with flexible R&D support over your product life cycle

CLUSTER CONTACTS:

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INDUSTRY 4.0 IN PRACTICE

![Nortal]

Hack your business with **Nortal**

Come and talk to the winner of IndustryHack at our stand.

Photo by Industryhack

Name your challenge and let's work on it together.

#industrialinternet   #bigdata   #machinelearning   #scm

#systemintegration   #smartfactory   #iot   #seamlesssociety

Organisers & Partners