The future perspectives for Nordic engineers in the new world of work

Memory book: Conclusions
10 years’ anniversary workshop
The future perspectives for Nordic engineers in the new world of work

To mark the 10 years of cooperation, the Association of Nordic Engineers, ANE has organised the workshop: The future perspectives for Nordic engineers in the new world of work on 15th May in Stockholm.

In the new world of work and evolving environment, innovation competences are essential for graduates and professionals to be successful. The disruption caused by automation and development of new technologies challenges the education systems, polarises the labour markets and affects our lives. The emergence of new sectors and growing impact of the artificial intelligence demand new skills and competences, and call for the modernisation and agile responses in all sectors. Innovation is one of the driving forces in each society, and engineers play a crucial role in contributing with their creativity and knowledge. The engineers, like all other employee categories should prepare their mindsets for responses to the disruption created.

The workshop has engaged participants from the three founding organisations: IDA, NITO and Sveriges Ingenjörer in the knowledge sharing on the best practices and discussion on the new requirements for skills, diversity in the workplace and impact on engineers’ work, as well as the role of engineers in ethics standards.

More particularly, the participants had a chance to discuss how their organisations could help their members to remain competitive and secure their employability in these times of constant change. In addition, the following questions were further explored: How can the organisations secure a decent and safe working life for their members in the future? How to ensure that each engineer prioritises ethical considerations in the design and development of autonomous systems?

The workshop provided a platform to:

- Inform about the new ANE strategy and activities,
- Share ideas by demonstrating the existing good practices,
- Engage participants in the discussions on the current challenges,
- Formulate recommendations for the way forward.

Additional information, including background documents and presentations can be found on the ANE website: http://nordicengineers.org/content/meeting-documents
During the welcome speech, Trond Markussen, President of ANE has said that ANE was an alliance of similarly minded people, where sharing knowledge and promoting best practices was at core in order to raise awareness of the Scandinavian engineers in the region and beyond. “We, the three organisations, representing our members’ interests should use the momentum today in anticipating solutions, which our members will be requiring from us tomorrow. Therefore, working together and exchanging our ideas in partnership is more important than ever. While Nordic engineers are improving human lives, we are working together on making their working conditions better,” concluded Trond.

The world cannot function without engineers
"When it comes to the technological development and automatisation, the engineers have the answers and the world cannot function without them,“ - according to Jens Bundvald, General Secretary of Industrianställda i Norden. Further, in his welcome speech, Jens stressed that large Nordic companies had the opportunity to be leaders in technology, while SMEs would need assistance in managing the transition. Their employees will need re-skilling, and therefore, the focus of social partners should be on continuous training. "At a time of false news, engineers who have a scientific approach to things are incredibly important. And we must get the rest of society and politicians to understand the important role engineers play in the society,” pointed Jens.

Voice of engineers at Nordic level
As said by Per Klok, former ANE General Secretary, the priority number one of the ANE back in 2007 was influencing the EU decision-making in relevant policy-areas and building a robust legacy of the engineers’ role and profession at EU level and globally. In addition, creating alliances and partnerships with different stakeholders was a prerequisite for a newly established organisation. According to Inese Podgaiska, current ANE General Secretary, the new ANE strategy prioritises the knowledge building and knowhow sharing in the areas of skills and competence development, new world of work, including artificial intelligence and the role of engineers in reaching the sustainable development goals. In the future, ANE should become bigger (including Finland and Iceland) and revitalised (younger and gender balanced). The focus will be on establishing a strong political dialogue with international organisations both at Nordic and global level to become the real voice and trademark of Nordic engineers!

1 Quote from Winston Churchill
Sharing the low-hanging fruits

If you have an apple and I have an apple and we exchange apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas\(^2\).

ANE strives to finding common solutions to common challenges and handling in a more efficient way by learning from each other, by exchanging experiences and by getting inspired from each other. ANE initiates to work together and discuss the important matters, which will influence daily and working life of its members.

During the first plenary session, the three organisations had an opportunity to share their existing good practices and get inspirations for future work.

Ghita Wolf Andreasen, Project Director of the Engineer the Future, talked about the branding campaigns, which raise awareness of engineering and technology for young generation and picture authentic stories about young generation changing the world. The project involves 56 partners with the total budget of 4MEUR and targets school pupils.

Anne Cathrine Berger, Head of Policy department in NITO presented the project: The Political Engineer, which aims at strengthening the political and economic role of engineers. The project promotes the profession of engineers in the society and their voice in influencing the policy processes.

Staffan Bjurluf, Industry expert from Sveriges Ingenjörer spoke about The first engineer (Första Ingenjören), pilot project located in Jönköping that develops tools and methods to small companies to change attitudes and behaviour towards engineers.

\(^2\) Quote from George Bernard Shaw (1856-1950), Irish playwright & journalist
We need more engineers

Engineer the future was formed to ensure that Denmark would have the technological skills it needs to take a leading position in the technology sector. The project promotes the education of more and better-qualified engineers and science graduates, who can contribute to innovation, growth and production in the company. Some results of the project are - in 2015, the engineering programmes experienced a marked increase in the number of applicants (10-18%) and an intake of 7%. 20% from 400 students said that the campaign had directly influenced their choice of study course. “We work together in order to qualify our activities, to disseminate fruitful initiatives nationally, and to ensure that everything we do is firmly anchored and viable. Together with partners we are creating social responsibility around an important agenda for our society as a whole,” underlined Ghita Wolf Andreasen. The challenge experienced today is to keep the interest of companies being involved in the long-term. Children being the target audience of the project is far-stretched from the employer branding and benefits of today.

Engineers cannot sit and wait until they are asked to dance

“The engineers have the solutions, and those solutions should be a part of political decisions. A survey shows that there are few minsters and parliamentarians with engineering background. And this is a problem, since we are looking for concrete solutions,” stressed Anne Cathrine Berger. To strengthen the political role and enhance the social influence of engineers, NITO has developed a political strategy. This strategy targets political campaigns, policy development, and decision-making. Four scenarios on competence development, technology, job creation and role of union were developed for the upcoming parliamentary election in September 2017. The results from those scenarios showed that the Norwegian model was under the pressure and engineers feared unsecure employment. “The society needs engineers to solve challenges! Though, the challenge I see is that the engineers are not proactive in showing that they are the ones behind the technologies we use every day, and the voice of engineers didn’t reach the ear of politicians yet,” further underlined Anne Cathrine.

Engineers make business blossom

The project: The first engineer tries to change attitude and show the benefits from hiring an engineer. “Engineers contribute to the small and medium-sized companies growth. We have documented that the productivity and sales have increased if the company hired an engineer. It also led to an increased employment,” said Staffan Bjurulf. The results of the project also show that if the small company wants to grow, it needs additional skills. Engineering skills are often the ones that contribute to this growth by increasing production and saving costs. Today, 14 companies have started the recruitment process of the first engineer and nine engineers have been recruited. “The challenge today is to changing attitudes both in business representatives and in engineers, which is a very long process. This should be taken into consideration while considering to spreading and implementing the project across the country, going beyond Jönköping Region,” concluded Staffan.
Key messages and conclusions from the parallel sessions

**New demands for skills and competences: What is the impact on engineers?**

The participants had an opportunity to learn about PROMT project, funded by Knowledge foundation, which aim is to increase innovation in industry by developing online training courses free of charge. In addition, the Royal Institute of Technology (KTH) presented its developed vision for education towards 2027/2028 – a suggestion about how the business will look in 10 years and how it would impact students, teachers, alumni and employers. The highlight of the session is to establish embedded universities, where focus is on exchanging knowledge in innovative ways. The participation in courses in those universities would require a membership. The membership is granted after the approval of the entrance exam, and in the same time they would also get a personal Artificial intelligence (AI) mentor, which would follow them during all duration of studies. Through this membership, students would also benefit from KTH insurances. In addition, a special fund for lifelong learning should be created and exist in each country.

**New challenges and opportunities of the digitalisation: How can we secure new working life for engineers?**

The Eurofound presentation highlighted the impact of new employment forms on working conditions and the labour market, in terms of increasing heterogeneity of employment forms, technology being as one of the drivers and a potential for structural change of the labour market. Today, both employer and employee are experiencing the same degree of problems. The actions from the session are: 1) Continue learning from each and use the IDA results from the survey on atypical working as the basis for the joint analysis; 2) While adapting the Nordic legislation to the new forms of employment, one should start by conducting the service-check of the current agreements. Adaptable working contracts is the new black to secure members’ rights! 3) Provide networking possibilities and meeting spaces to avoid isolation; 4) Tackle issues related to outsourcing, especially as regards taxation issues, data production and liability.

**Artificial intelligence (AI): What is the engineers’ role in ethics standards?**

According to Gry Hasselbalch presentation, all Artificial Intelligence (AI) systems can be designed, influenced and regulated. The AI are data processing systems, they are not a free agent. Engineers build social systems, and they are relevant in the design of ethical standards. The question that we all should be asking is which social, cultural norms, values and interests do engineers represent and enact when they design AI systems. Today, the need for AI ethics review and social impact assessment of the AI design is pressing. The key messages from discussions are as follow: 1) Engineers and technologists should agree on “basic rules”, which should be a part of the design process, e.g. privacy by design; 2) Ethics should be a part of the education systems; 3) Engineers shall take the responsibility for the products they create. Engineers are improving human lives while doctors are saving human lives. The responsibility degree is somehow similar, and therefore the engineers should swear by the Hippocratic Oath; 4) Ethics should go hand-in-hand with the brand of the company, it must be “uncool” to abuse technology. Ethic assessment should be embedded in the company culture.
“Opinion battle” between generations

“We should re-think and use the new knowledge to deal with new challenges. We should have right circumstances to use our skills. Lifelong learning is the must and is our future. An idea could be to save money for further education, the same way we safe for a car, pension and other things. Or a special fund for the continuous education could be created,” stated Ulrika Lindstrand.

In response to Ulrika, Omar Samy Gamal said that the education was the fundamental right and therefore, access to it had to be free of charge. Moreover, Omar pointed out that engineers should be naïve, believe that they can save the world and not be afraid of failures. When it comes to the Artificial intelligence, Omar thought that the development was unavoidable and that the machines would take over humans. “Of course, we do not want to be replaced as humans, but it is a waste of time to do the work that machines can do. I think, we need people in positions that require empathy, creativity and complex tasks involving ethics. Everything else we can leave to AI”, added Omar.

According to Lia Karida, everyone, regardless of family background and economic situation, should have access to education system. “We need diversity among engineers. We have to make sure that we provide opportunities from the start,” stated Lia. The engineers should be socially committed to the society, and the education should be more adopted to the impact of new technologies and digitalisation. “We, engineers solve problems. We think outside the box and focus on the goals. We must continue to find solutions, although it is not always as simple,” further continued Lia.

“We need education that provides broader knowledge, where we also learn social skills and creativity. Skills that also employers are looking in employees. Establishing a fund for lifelong learning is a certain limitation, people should have an interest in acquiring knowledge. I am keen to learn more after I finish my studies. Therefore, it is important that the studies are not specialised. You can get specialisation through your work experience or willing to learn about a specific area,” underlined Harald Gade Andersen.

Low wages, uncertainty about whether you will receive your pay and who owns the products and services you produce - are some of the risks that the new forms of employment bring with them. At the same time, they give a high level of autonomy. More flexible relation to the employer also means that upskilling, insurance, work environment and pension are the questions that need to be closely looked at. Trond Markussen promised to look into those challenges by creating physical meeting places. “We should always be a step forward. Engineers create future, nothing is impossible with engineers on-board,” concluded Trond.

Thomas Damkjær Petersen found the exchanges with young generation very inspirational and he liked being challenged by strong and straightforward opinions. As regards the artificial intelligence and ethical standards, Thomas proposed to establish the Hippocratic Oath for engineers. “It is certainly true that engineers play an important role when it comes to incorporating ethical standards in artificial intelligence. It is also important that the processes are open and transparent so that everyone knows how the products and services operate. Engineers should swear to only develop products and services that are the best for people and society,” added Thomas.
Why do they become engineers?.....

Curiosity and doing good to mankind were the reasons for Ulrika to become an engineer. As a child she liked to watch the production lines on TV and how the ice was dipped into chocolate before it got frozen.

Thomas accompanied his friend, who wanted to get into the Danish Technical University. Thomas got in, but not his friend.

Trond liked to pick things apart. Being a computer engineer gives platform for many possibilities.

Lia has chosen the data technology to try something new, but was not aware about the gender balance issues. Today, she feels like fish in the water, even if in the beginning she though the studies were boring.

Harald is unsure why he has chosen this path, a part from considering maths and physics quite fun.

Changing the world and saving the humanity, as well as being good in maths and physics were the drivers for Omar to choose the engineering studies. In addition, getting a good education was the must for his parents, who immigrated to Europe and valued the high quality education.
Engineers like to create and connect....
…..and what a Birthday without the Birthday song...

ANE “hun” er fødselar-födselar
Bursdag på 10 år hun har
Rejst er vi fra hele Norden hid
Ingeniører er et hit!

Cool to be an engineer – engineer
In to future we will steer – we will steer
Hope to change the world a little bit
With our very special wit.

Lifelong learning is a choice – is a choice
Politicians: hear our voice – hear our voice.
Need new systems for the schooling world
Courses we will help emerge.

Ethic standards we should set – we should set
Robots aren’t quite there yet – quite there yet.
AI – full of possibilities
We apply our expertise.

Engineers with head and heart – with head and heart
Solving problems is a part – is a part
of the way we think and how we live
Engineers – we like to give.

Thank you ANE for today – for today.
You have helped us lead the way – lead the way.
Trond, Ulrika, Thomas and Inese
Will you make us raise our glass?
Stay tuned to ANE work on:
http://nordicengineers.org

Articles from NITO Refleks on ANE workshop:
https://nitorefleks.no/arbeidsliv/unge_ingeniorer/
https://nitorefleks.no/arbeidsliv/nordiske_ingeniorer/

ANE workshop film:
https://www.dropbox.com/s/mjknmxyj2lb3ljk/ANE%2010%20years.mp4?dl=0

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Thank you!