INTRODUCTION

Artificial intelligence (AI) is already part of our daily lives. From using a virtual personal assistant to organise our working day, to travelling in a self-driving vehicle, to our phones suggesting songs or restaurants that we might like, AI is a reality.

Beyond making our lives easier, AI is helping us to solve some of the world's biggest challenges: from treating chronic diseases or reducing fatality rates in traffic accidents to fighting climate change or anticipating cybersecurity threats. For example, in Denmark, AI is helping save lives by allowing emergency services to diagnose cardiac arrests based on the sound of a caller's voice and in Austria it is helping radiologists detect tumours more accurately by instantly comparing x-rays with a large amount of other medical data. Many farms across Europe are already using AI to monitor the movement, temperature and feed consumption of their animals. The AI system can then automatically adapt the heating and feeding machinery to help farmers monitor their animals' welfare and to free them up for other tasks.

These are some of the many examples of what we know AI can do across all sectors, from energy to education, from financial services to construction. Countless more examples that cannot be imagined today will emerge over the coming years. Like the steam engine or electricity in the past, AI is transforming our world, our society and our industry. Growth in computing power, availability of data and progress in algorithms have turned AI into one of the most strategic technologies of the 21st century. The stakes could not be higher. The way we approach AI will define the world we live in.

What is artificial intelligence? AI refers to systems that display intelligent behaviour by analysing their environment and taking actions - with some degree of autonomy - to achieve specific goals.

AI based systems can be purely software-based, acting in the virtual world (voice assistants, image analysis, search engines, speech and face recognition) or AI can be embedded in hardware devices (advanced robots, autonomous cars or drones).

We are using AI on a daily basis, e.g. to translate languages, generate subtitles in videos or to block email spam. Many AI technologies require data to improve their performance. Once they perform well, they can help improve and automate decision making. For example, an AI system is trained and then used to spot cyberattacks on the basis of data from the concerned network.
AI will also play a key role in renewing and improving the public sector in Europe. This was for example highlighted by the Norwegian Association of Local and Regional Authorities in its Strategy for Digitalisation in municipalities and counties. The demographic changes necessitate major restructuring. Increased automation of communication and procedures in and between public services, and between public services, citizens and business, can be an important step. The use of welfare technology can alleviate the need for manual assistance to the elderly and the needy and contribute to increased quality of life for the individual.

Technology development and digitalisation is a driving force for how the municipal sector organises, develops and delivers services. The municipal sector must plan for comprehensive and coherent digital services to meet the needs of the citizens and the business community and to be able to utilise digital data in the planning and follow-up of their own services.

A EUROPEAN APPROACH TO ARTIFICIAL INTELLIGENCE

Artificial intelligence has become an area of strategic importance for the EU and a key driver of economic development in Europe. It is bringing forward solutions to many societal challenges from treating diseases to minimising the environmental impact of farming. However, social, economic, legal and ethical impacts must be carefully addressed.

In its Communication from April 2018 the European Commission put forward a European approach to artificial intelligence. The aim is to ensure that Europe is at the forefront of the AI technological revolution and thereby ensure that Europe retains its competitiveness and ability to shape future conditions for AI development and use.

The European Commission approach is based on three pillars:

Pillar 1: Being ahead of technological developments and encouraging uptake by the public and private sectors.

Investment levels for artificial intelligence in the EU are low and fragmented, compared with other parts of the world such as the US and China. The European Commission foresees increased coordination of European investments, leading to higher synergies. This includes 20 billion Euros of public and private investments in AI research and innovation from 2018 until the end of 2020 and more than 20 billion Euros per year from public and private investments over the following decade.

To complement national investments in AI, the European Commission will be investing 1.5 billion Euros by 2020 through Horizon 2020. This is a 70% increase compared to 2014-2017. For the next long-term EU budget (2021-2027) the EU has proposed to invest at least 7 billion Euros in AI through Horizon Europe and the Digital Europe Programme.

This plan also proposes a more joint approach to ensure closer and more efficient cooperation between EU Member States, the EFTA States and the European Commission in four key areas:
- Increasing investment;
- Making more data available;
- Fostering talent;
- Ensuring trust.

Pillar 2: Prepare for socio-economic changes brought about by AI.

To support the efforts of the EU Member States which are responsible for labour and education policies, the European Commission is proposing the following:

- Support business-education partnerships to attract and keep more AI talent in Europe;
- Set up dedicated training and retraining schemes for professionals;
- Foresee changes in the labour market and skills mismatch;
- Support digital skills and competences in science, technology, engineering, mathematics, entrepreneurship and creativity;
- Encourage EU Members States to modernise their education and training systems.

Pillar 3: Ensure an appropriate ethical and legal framework

Some AI applications may raise new ethical and legal questions relating to liability or fairness of decision-making. The EU Data Protection Regulation is considered a major step for building trust in AI technology and the European Commission is preparing the next steps by ensuring the legal and ethical clarity for AI based applications.

One of those steps is the 2019 Ethics Guidelines for Trustworthy Artificial Intelligence prepared by the High-Level Group on Artificial Intelligence and published on 8 April 2019. The European Commission will also develop and make available guidance on the interpretation of the Product Liability Directive.

The European Commission invites all Member States to implement the coordinated plan, including the development of national AI strategies by mid-2019, outlining investment levels and implementation measures.

**LEGAL & ETHICAL QUESTIONS IN RELATION TO ARTIFICIAL INTELLIGENCE**

An environment of trust and accountability around the development and use of AI is needed. In Europe there is a robust regulatory framework for the rights of our citizens and it is important to build on this when setting up a global standard for a sustainable approach to this new technology.

An important part of a robust European AI regulatory framework is the EU Data Protection Regulation. The aim of the regulation is to ensure a high standard of personal data protection. It also guarantees the free flow of personal data, and it contains provisions on decision-making based solely on automated processing, including profiling. In such cases, data subjects have the right to be provided with information about the logic involved in such
decisions. The regulation also gives individuals the right not to be subject solely to automated decision-making, except in certain situations.

The European Commission has plans to follow the regulation's application in the context of AI and has called on the national data protection authorities and the European Data Protection Board to do the same. The European Commission has also put forward a series of proposals under the Digital Single Market strategy that will be a key enabler for the development of AI, such as the Regulation on the Free Flow of Non-Personal Data, the ePrivacy Regulation and the Cybersecurity Act.

To further strengthen trust, people also need to understand how AI technology works. This is important in order to increase transparency and minimise the risk of bias or error. AI systems need to be developed in a manner which allows people to understand the basis of their actions. Like every technology or tool, AI can be used to positive but also to malicious ends. Whilst AI clearly generates new opportunities, it also poses challenges and risks, for example in the areas of safety and liability, security, bias and discrimination.

Increased use of AI technology raises many ethical questions. This includes issues such as fairness, safety, security, social inclusion and algorithmic transparency. These issues need to be considered in broad terms, including the impact on fundamental rights such as privacy, dignity, consumer protection and non-discrimination.

Safety and liability are an important factor when it comes to the use of AI. The emergence of AI requires a reflection about the suitability of some of the established rules on safety and liability. This is in particular the case with regard to features such as autonomous decision-making. For instance, advanced robots and internet products empowered by AI may act in ways that were not envisaged at the time when the systems were first put into operation. Given AI’s already widespread use, both horizontal and sectoral rules will need to be reviewed.

Consumer rights is another area of concern. The large-scale use of AI-enabled tools in business-to-consumer transactions need to be fair, transparent and compliant with consumer legislation. Consumers need to receive clear information on the use, features and properties of AI-enabled products. Individuals need to be able to control the data generated by using these tools and should know whether they are communicating with a machine or another human. This includes informing consumers on how to reach a human if needed, and how to ensure that a system’s decisions can be checked or corrected. Also, while there are reasons to be concerned, empowering individuals and consumers to make the most of AI is also essential for European societies.

The European Commission published in April 2019 ethical guidelines in relation to the use of AI technology. According to the guidelines, trustworthy AI should be:

- Lawful - respecting all applicable laws and regulations;
- Ethical - respecting ethical principles and values
- Robust - both from a technical and social perspective.
In addition to this, the guidelines put forward a set of 7 key requirements that AI systems should meet in order to be deemed trustworthy.

**Human agency and oversight**: AI systems should empower human beings, allowing them to make informed decisions and fostering their fundamental rights. At the same time, proper oversight mechanisms need to be ensured.

**Technical robustness and safety**: AI systems need to be resilient and secure. They need to be safe, ensuring a fall-back plan in case something goes wrong, as well as being accurate, reliable and reproducible.

**Privacy and data governance**: Besides ensuring full respect for privacy and data protection, adequate data governance mechanisms must also be ensured, taking into account the quality and integrity of the data, and ensuring legitimised access to data.

**Transparency**: The data, system and AI business models should be transparent. Moreover, AI systems and their decisions should be explained in a manner adapted to the stakeholder concerned. Humans need to be aware that they are interacting with an AI system, and must be informed of the system’s capabilities and limitations.

**Diversity, non-discrimination and fairness**: Unfair bias must be avoided, as it could have multiple negative implications, from the marginalisation of vulnerable groups, to the exacerbation of prejudice and discrimination.

**Societal and environmental wellbeing**: AI systems should benefit all human beings, including future generations. It must hence be ensured that they are sustainable and environmentally friendly.

**Accountability**: Mechanisms should be put in place to ensure responsibility and accountability for AI systems and their outcomes.

The ethical guidelines also consist of a checklist that is intended to operationalize the ethical requirements ("Trustworthy AI Assessment List"). An evaluation of how the guidelines have been received and put into practice will be published in early 2020. This will form the basis for the European Commission's further work in the area.

In parallel to this work, the European Commission is planning to open up a dialogue on ethical issues relating to the use of AI technology with their international partners. The close cooperation that the EFTA countries have with the EU is likely to result in increased discussion on AI related issues within the framework of the EEA Agreement and the bilateral agreements that Switzerland has with the EU.

The Nordic Council of Ministers introduced digitalisation as a new policy area in 2017. The goal is to turn the Nordic/Baltic region into a coherent and integrated digital region. Working together provides benefits for the people, businesses and public sectors of the Nordic and Baltic countries. A Report will be available early autumn 2019, focusing on how Nordic municipalities apply AI, and how AI could interact with good management in the Nordic countries.
DISCUSSIONS ON AI IN ICELAND, NORWAY AND SWITZERLAND

Iceland

In Iceland work on AI related issues is just starting. In February 2019 the Government published a report, *Iceland and the 4th industrial revolution*, where AI is among the main topics. The report investigates how new technology, including AI, will affect our societies and how important it is that the public and private sectors, along with the science community, work together to ensure that this new technology is benefitting us all.

The report highlights that the advancement of AI technology will dramatically change many aspects of Icelandic society. The effects are already being felt in many sectors of the economy where AI technology is already in use. The report stresses that this trend will continue and have even bigger impact as AI technology evolves.

The report also highlights that AI technology will play a key role in renewing and improving the public sector in Iceland. This will also affect how municipalities will be organising and delivering services for their citizens in the coming years. The City of Reykjavik is in the forefront of Icelandic municipalities in adapting to this new reality. For example, as a part of *Smart Cities*, the City of Reykjavik is now preparing for the use of AI technology when calculating financial assistance.

Increased use of AI technology will provide new solutions, new services and new jobs, but it will also drastically change the composition of the work force in Iceland. Based on calculations from the OECD, the report concludes that there is a high probability that almost 30% of the Icelandic labour market will undergo significant changes, or that jobs will disappear due to this new technology. This is a similar result as seen in studies for other Nordic countries. The report also concludes that almost 60% of the labour market in Iceland will undergo some changes due to this new technology, while only 14% will envisage small or no changes.

This underlines that all levels of government must work together, including municipalities, and in close cooperation with the private sector and the science community. The approach needs to be based on fundamental values and rights of our citizens, where education is the key and where it creates sustainable jobs and services for all.

Norway

Norway is engaged in several international fora working with development of strategies and guidelines for AI, among others the EU, OECD and the Nordic Council of Ministers. In April 2018, Norway signed the EC Declaration of Cooperation on AI, together with 24 other European countries, and has participated in the development of the EC Coordinated Plan on Artificial Intelligence. The Government is developing a Strategy for AI to be finalised by the end of the year. The Strategy will include considerations on ethics and privacy.
Norway has also participated in the OECD’s development of a recommendation on AI, which is expected to be finalised during spring 2019, cooperation with Estonia “Digital North”, and with the Nordic-Baltic cooperation on eGovernment, the Tallin Declaration.

In January 2019 a new Minister for Digitalisation was introduced at the Ministry of Local Government and Modernisation (KMD).

The Government has made previous initiatives on ICT/digitalisation:

- “Digital Agenda for Norway” – White paper (2015-2016) to the Storting – with the purpose to present the Government's policy on how Norway can exploit ICT in the best interests of society.
- The development of a National Digitalisation Strategy for the public sector, to implement the “Digital Agenda”, was initiated in 2018.

Research and development hubs on AI are established. The Telenor-NTNU (the Norwegian University for Science and Technology) AI lab in Trondheim, and House of CAIR (Center for Artificial Research) at the University in Agder (UiA), Grimstad, should be mentioned.

As referred to in the introduction, KS developed a Strategy for Digitalisation in Municipalities and Counties 2017-2020, as a follow-up to the National Digital Agenda, and has established a department for digitalisation, research and innovation in KS.

**Switzerland**

The Federal Government wants Switzerland to exploit the opportunities of digitalisation to the full. It adopted therefore in September 2018 a "Digital Switzerland" strategy for the next 2 years. The strategy provides the guidelines for government action and indicates where and how authorities, academia, the private sector, civil society and politics must work together in order to shape the transformation process for the benefit of everyone in Switzerland. The implementation activities in relation to the strategy are published in an action plan, updated annually.

The action plan includes a chapter on “Data, digital content and artificial intelligence”. According to the Federal Government, basic conditions in these fields “must be shaped in such a way that algorithmic decision-making systems are transparent and verifiable, that responsibilities are regulated and that the systems in use respect the prevailing values and legislation”.

Within the framework of the “Digital Switzerland” strategy, a working group on artificial intelligence and support initiatives in relation to Smart Cities has been established under the lead of the State Secretariat for Education, Research and Innovation. Its report, expected in the autumn, should list existing measures regarding AI and explain where new ones should be taken if needed. The question of establishing a competence centre for AI within the federal administration will also be looked at in this context.