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Management in the Age of Artificial Intelligence

Economy, Employment, Ethics

Seminar on Friday 25.5.18 in Mainz

CEC European Managers organises its seminar on “Management in the Age of Artificial Intelligence” in the framework of its triennial congress on 25. May in Mainz. In many regards, executives, managers and professionals are at the forefront of the ongoing digital revolution. Besides taking decisions on the ‘if’ and ‘how’ of implementing digital technologies in their company (be it in the public or private sector), they are also shaping the way how employees are equipped with the necessary skills and how they make use of the technologies.

1. Introduction

As an integral part of our increasingly complex and multi-faceted economy and world of work, it is of crucial importance that managers as key actors for a more sustainable and inclusive development are also well-informed and conscious about the implications these new tools can bring. Seizing the opportunities responsibly without neglecting a sound analysis of potential risks is part of CEC’s self-understanding when it comes to taking decisions for the future.

As an integral part of our societies and through CEC as a European Social Partner, managers support policy makers in accompanying the current transformations. The latter affect all parts of our private and working life and should therefore be subject to a comprehensive understanding thinking all aspects together. Therefore, this seminar takes a closer look on how digital technologies and Artificial Intelligence in particular relates with economic factors, such as productivity and innovation capacity, employment-related factors, such as the quality and quantity of jobs, and ethical factors, such as the social benefits of AI and related technologies.

The seminar aims at drawing the bigger picture, rather than concentrating on isolated questions like job losses or innovation capacity alone. Due to the interrelated nature of both modern leadership ([see the dossier of our last seminar](#)) and the dynamics of technological development¹, the focus will be first on situating our contemporary knowledge on the various dimensions – Economy, Employment, Ethics – to take more informed decisions in different policy areas and in the companies themselves. This reasoning is even more relevant when considering the blurring lines between public and private decision-making.

Besides the assessment of the risks and opportunities of AI, robotics and other digital technologies, the debate therefore also aims to bring light on the kind of action needed at company and social dialogue level to allow for a sustainable and inclusive socio-technological development². Which role can individuals, organisations and political institutions concretely play in this regard? How can the risk and opportunity assessment help to better define the utility of technologies we would like to develop for the future?

To account to the various policy areas, policy levels (local to European) and actors involved (individual managers, companies, institutions), CEC is more than pleased to host a diverse set of speakers and participants who together will bring in their perspectives to the various dimensions mentioned: from business experience over considerations on legal implications to the macro-economic impact on employment. Furthermore, the results of the European Managers Panel among 1400 European executives, managers and professionals on “Management in the Digital Era” will be presented to situate the experience managers have made during the last ten years with the digital world.

To concretely showcase how AI and robotics can be used for the green transformation, a presentation will be given on how oil technologies can be reconverted with the help of the new technologies.

And finally, the seminar will serve as the launch event for CEC’s process towards an Ethical Code of Conduct in the digital age. CEC is convinced that the critical debate held within the seminar will contribute to formulate a managerial point of view on the fundamental policy challenges that these technologies bring along.

¹ CEC believes that it would be a mistake to take a techno-deterministic view on the current developments, as it has stated in its foundational document “Managers in Europe”. Social and cultural factors are very relevant when it comes to how technologies are conceptualised, implemented and developed, whereas physical factors are delimiting the field of the possible. Managers and social dialogue are central for accompanying these developments within a human-centric approach.

² A thought provoking framework, “[Ethically aligned design](#)”, has been developed by an international consortium coordinated by the Institute of Electrical and Electronics Engineers (IEEE)



2. Seminar Agenda

- 9.00 Registration
- 9:30 Greetings by Dr. Roland Leroux (President of ULA)
- 9:35 Greetings by Michael Ebling (Mayor of Mainz)
- 9:40 Opening remarks by President of CEC
- 9:50 Presentation of European Managers Panel results by Jean-Philippe Steeger (Policy and Communication Officer, CEC)
- 10:10 Keynote speech
How artificial intelligence impacts labour and management
 By Dr. Gerlind Wisskirchen (Vice Chair for Multinationals of the IBA Global Employment Institute, Partner CMS Germany)
- 11:00 Break
- 11:15 Panel discussion
AI fact check: high ambitions and nothing behind? The state of play on the field
 With Dr. Gerlind Wisskirchen (Vice Chair for Multinationals of the IBA Global Employment Institute Partner CMS Germany), Andrea Penza (Federmanager, Italy), Eleonora Peruffo (Eurofound), Guy Masmonteil (EWC of Engie)
- 12:30 An example from the field: How can oil technology be applied to the green shift through AI?
 By Tor Haehre (Lederne NO)
- 12:45 Wrapping-up session
- 13:00 Lunch

3. Background Dossier

This dossier covers various perspectives on the changes associated to the development of Artificial Intelligence in particular and digital technologies in general. After having introduced artificial intelligence, the dossier briefly summarises some key questions and issues in the various domains listed below.

Artificial intelligence – between utopia, dystopia and banal calculations

While the notion of human intelligence had already been subject to vivid debates (think emotional intelligence), Artificial Intelligence (AI) is becoming a new major topic in many areas from philosophy over business to politics. The IBA's Global Employment Institute uses a definition of AI as "investigating intelligent problem-solving behaviour and creating intelligent computer systems." The 'weak AI' type designates **machines' problem-solving capacities** for rather delimited cognitive tasks. By contrast, projections on machines becoming more intelligent and autonomous ('strong AI' type), replacing humans ('singularity') or becoming one with humans ('transhumanism') are more speculative and subject to greater controversies.

The first milestone for the development of Artificial Intelligence was the **Turing Machine**, invented by Alan Turing in 1936. The Turing Machine is a computational model able to imitate and reproduce human-like behaviour and reasoning.

In 1997, Deep Blue's chess game victory against Garry Kasparov sparked a new interest in AI. The deeper technical advances of the AI revolution however began in the 2000s with the emergence of **machine learning techniques and big data**. The algorithms behind these systems work by identifying statistical correlation in the data (so-called training data) that they analyse, enabling them to perform tasks for which intelligence is required if a human were to perform them.

Today, **artificial neural networks** (ANN) are used for the development of AI. In an ANN, a large number of units (artificial neurons) are connected with each other to create a complex network of interactions with different layers. It is hoped that they could help to develop strong AI, which designates the ability to display human-like intelligence and common sense, and which might be able to set its own goals.

The fields of **applications of AI** are manifold and include: picture categorisation/clustering, online translations, search engines, self-driving vehicles, medical diagnosis, invention analytics, management performance analytical software, song creators and many others.

Read more about Artificial Intelligence in the [European Parliament Research Briefing](#)

1. Job creation, job destruction & productivity

There are no conclusive studies on the question, whether technological productivity gains through innovation could compensate potential job losses through automation. The range of projections for job losses range from moderate decreases to much larger ones. Few studies have taken account of the role of social dialogue's and legislation's (potential) impact on job gains or losses.

- An OECD study from 2012 (Handel) found that the increased demand for skills associated with managerial and professional occupations will lead to **higher shares of managers and professionals** in the working population (job polarisation) – an ongoing and lasting trend. [Read more](#).
- The often quoted study by Osborne & Frey from 2013 found that **47% of occupations** in the United States are at **high risk of being automated**. [Read more](#)
- A 2017 McKinsey study on the automation potential of different sectors and activities (with data from the US Bureau of Labor Statistics) found that the **functions of management and professionals have an automation potential of 35%**. [Read more](#)
- OECD study "Automation, skills use and training", 2018: About **14% of jobs in OECD countries participating in PIAAC³ are highly automatable** (i.e., probability of automation of over 70%). A high variety among the 32 analysed states exists. Many tasks will change significantly, not always leading to job losses. [Read more](#)
- The Bruegel study (Petropoulos 2018) on the impact of industrial robots on EU employment and wages, following the local labour market equilibrium approach (by Acemoglu and Restrepo, 2017), finds that the impact of **one additional robot per thousand workers reduces the employment rate by 0.16 - 0.31 percentage points**. The job replacement effect is larger than productivity gains. [Read more](#)

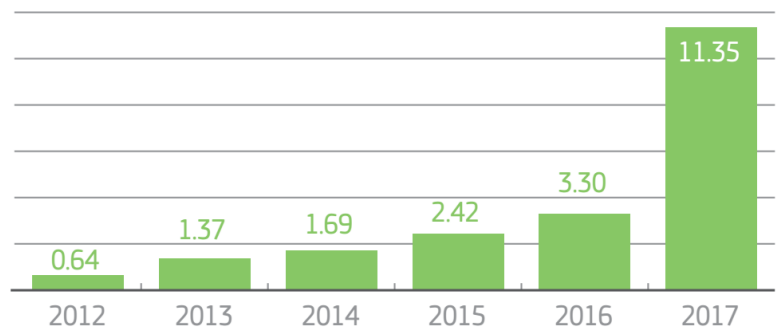
³ OECD's Programme for the International Assessment of Adult Competencies

2. State of development of AI and other digital technologies and their future potential

- Financing of AI is growing fast globally, with large sectorial and national differences. According to McKinsey, companies invested around 26-39bn USD on Artificial Intelligence in 2016 with an annual growth rate of 20%. The ICT, automotive and financial sectors were the strongest digital adopters. 20 percent of companies said they currently use any AI related technology at scale or in a core part of their businesses. Another estimate foresees that the European artificial intelligence market grows at a CAGR⁴ of 43.2% from 2016 to 2022. The data on the AI market should, however, be subject to caution.

Figure 1: Global AI financing expanding fast

Billion euro



Source: Venture Scanner, Artificial Intelligence Startup Highlights, Q4 2017

- In its strategic note, the European Commission's European Political Strategy Centre takes stock of where Europe stands in the development of the digitalisation of industries.

Only 4% of world data is stored in the EU and a mere 25% of large EU enterprises and 10% of EU SMEs used big data analytics in 2017. From a more political perspective, the note takes stock of Member States' initiatives in the domains of digital industry strategy, R&D and education. The table (left) presents an overview on these different initiatives. [Read more](#)

	AT	BE	CZ	DE	DK	ES	FR	HU	IT	LT	LU	NL	PL	PT	SE
DIGITAL INNOVATIONS FOR ALL	Test-beds			●			●	●		●		●	●	●	●
	R&I infrastructure	●	●		●		●	●	●		●		●	●	●
	DIH	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Clusters		●		●	●	●		●	●	●	●		●	
R&D PROGRAMMES	Basic technology research	●	●		●		●	●	●			●	●	●	
	Industrial/Applied research	●	●	●	●	●	●				●	●	●		●
	Pilot & Demonstrators	●	●		●	●		●			●		●	●	●
	Standardisation	●			●		●	●		●	●	●	●	●	
	International cooperation	●	●	●	●		●	●	●	●					●
	R&I PPPs				●				●		●	●			●
	Regional level		●		●	●	●					●			●
	REGULATION		●	●	●	●	●	●	●		●	●	●	●	●
DIGITAL SKILLS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

National actions along the DEI strategy

⁴ The compound annual growth rate (CAGR) is the mean annual growth rate of an investment over a specified period of time longer than one year.

- Eurofound's overview report (which will be presented at the seminar by Eleonora Peruffo) summarises the findings of five case studies on the likely **impact of game changing technologies on production and employment in the manufacturing sector in Europe** up to 2025: advanced industrial robotics; industrial internet of things; additive manufacturing; electric vehicles; and industrial biotechnology. Besides defining these technologies and assessing their development (and barriers), the report also takes a closer look at supportive policies and occupational shifts. [Read more](#)

3. Working conditions, management and leadership

- The "[Artificial Intelligence and Robotics and Their Impact on the Workplace](#)" report (which will be presented by Dr. Gerlind Wisskirchen at the seminar) from the International Bar Association's Global Employment Institute focuses on **potential future trends of AI, and the likely impact intelligent systems will have** on: the labour market, the structures of companies, employees' working time, remuneration and the working environment. It also assesses the legal implications at different points in the automation cycle – from the developmental stage, when computerisation of an industry begins, to what workers may experience as AI becomes more prevalent, through to issues of responsibility when things go wrong. [Read more](#)
- The working paper "**Digitalisation of the economy and its impact on labour markets**", published by ETUI, presents the evolutions in the labour markets (job creation, destruction and shifts), industry and services (blurring lines) and working conditions in the digital economy (crowdwork, on-demand work, flexibilisation etc.). [Read more](#)
- The report "**Les managers face aux disruptions numériques**" of the International Social Observatory takes stock of managers' experiences with digital technologies. Often, the report finds, managers implement new technologies to increase (short-term) productivity. However, many experience difficulties in understanding the way they are used by employees, thus creating potential for adverse consequences. Furthermore, few managers deal with innovation, changes in decision-making and cybersecurity. The report calls for more experimentation, transversal modes of working and a new way of thinking general performance. [Read more \(French\)](#)
- In 2017, CEC European Managers has conducted a survey on "**leadership of the future**", as well as a seminar on the topic. The fruit is its report which finds that so-called 'connected-leadership' increases organisational performance in multiple dimensions. A continuous process of reflection, assessment, implementation and collaboration was more indicative of performance than any other measure. A leader in the digital world "has learned to see those connections and develop the networks of knowledge, information, space, and social capital necessary for managing and increasing organisational or system performance." [Read more](#)

4. Ethics and legal questions

■ Privacy and predictability

To counter the abuse of probabilistic prediction and the risks to privacy, in April 2016 the European Parliament and the Council of the EU adopted the **General Data Protection Regulation (GDPR)**. The European Parliament also requested an update of the Union **legal framework on robotics** in February 2017. The [recommendation](#) proposes to create a system of registration of advanced robots. Much emphasis has been put on ethical issues of robotics, which should govern the design, production and use of robots and would complement the legal framework recommended by the draft report. Recently, the European Commission has called for a [high-level expert group on AI](#).

■ Inequality

With higher returns on capital through digitalisation and growing unemployment, the trend of further accumulation of capital is likely to continue (today, the richest 1% own 50% of global wealth⁵, expected to grow to 66% by 2030⁶) Proposed solutions include to favour workers' ownership ([see](#) Freeman/IZA Germany 2014), a universal basic income (or similar approaches), as well as other classical tools to reduce wealth inequality.

■ Bias and discrimination

The [famous example](#) of a juridical algorithm supposed to predict future criminals has demonstrated that human racist assumptions (here, a bias against black people) can be reproduced by machine learning.

■ The IEEE⁷ Global Initiative on Ethics of Autonomous and Intelligent Systems produced a framework on "ethically aligned design" which foresees the integration of well-being parameters, values and human rights into the design of these technological systems. The framework proposes concrete design measures, calls for value-based leadership and identifies key challenges to making these autonomous and intelligence systems work for the benefit of society. [Read more](#)

■ Some philosophers, computer scientists and other academics working or having worked on AI and/or the question of the nature of humans and the machine (including robot rights): Miguel Benasayag, Margaret Boden, Nick Bostrom, Daniel Dennet, Donna Haraway, Raymond Kurzweil, Antoinette Rouvroy, Joseph Weizenbaum

⁵ <https://www.credit-suisse.com/corporate/en/research/research-institute/global-wealth-report.html>

⁶ <https://www.theguardian.com/business/2018/apr/07/global-inequality-tipping-point-2030>

⁷ *Institute of Electrical and Electronics Engineers, a global professional organisation*