



the global voice of
the legal profession®

IBA Global Employment Institute

Digitalisation (Artificial Intelligence and Robotics) and its Impact on the World of Work – Part II



October 2024

Prepared by:

Gerlind Wisskirchen

Inka Knappertsbusch



the global voice of
the legal profession®

International Bar Association

Chancery House
53-64 Chancery Lane
London WC2A 1QS
T: +44 (0)20 7842 0090
F: +44 (2)20 7842 0091
editor@int-bar.org
www.ibanet.org

© International Bar Association 2024

Cover image: © Irin/Adobe Stock

CONTENTS

A.	KEY FINDINGS OF GEI REPORT, PART I (APRIL 2017)	9
B.	EXECUTIVE SUMMARY OF THIS GEI REPORT	10
	I. Digitalisation, AI (automation), and their effect on labour markets	10
	II. Impact by country	12
	III. The impact of digitalisation/AI on employment relationships	13
	IV. New structures in companies	14
	V. New working forms and their classification	14
	VI. Social media in companies	15
	VII. Challenge for policymakers: a flexible and up-to-date legal framework	16
C.	OVERVIEW: KEY FACTORS AND CHALLENGES	17
	I. Digitalisation	17
	II. Automation/robotisation	18
	III. Artificial intelligence	19
	IV. Skill gaps	20
	V. Gig work	21
	VI. Social, environmental and demographic changes	22
D.	DIGITALISATION, AI (AUTOMATION) AND THEIR EFFECT ON LABOUR MARKETS	24
	I. Overview: generative AI	24
	1. <i>General impacts of generative AI</i>	25
	2. <i>AI automation waves</i>	25
	3. <i>Areas of application for generative AI</i>	26

4.	<i>Increasing productivity through AI</i>	26
5.	<i>Next stage of development: large action models (LAM)</i>	27
II.	Impact of generative AI on specific professions	29
1.	<i>AI exposure and complementarity</i>	29
2.	<i>Automation and job demand trends</i>	32
3.	<i>Decoupling automation potential from expected job losses</i>	34
	A) TECHNOLOGICAL DIFFUSION	34
	B) EMPLOYEE FLEXIBILITY	35
	C) COMPENSATION MECHANISMS	37
4.	<i>Jobs in demand</i>	39
	A) CARE SECTOR	39
	B) IT SECTOR	40
5.	<i>New types of jobs</i>	40
III.	By sector	41
1.	<i>Service and industry sector</i>	42
2.	<i>Logistics and transportation sector</i>	43
3.	<i>Retail sector</i>	44
4.	<i>Legal sector</i>	45
5.	<i>Banking sector</i>	46
6.	<i>Creative jobs</i>	47
IV.	Changes and necessary skills on the future labour market	48
1.	<i>Wage/salary polarisation</i>	48
2.	<i>Different employability</i>	49
3.	<i>Digital transformation amid demographic shifts: opportunities and challenges</i>	49
4.	<i>Necessary skill set for workers in the future</i>	51

5.	<i>Necessary skill set for managers in the future</i>	52
6.	<i>Four key priorities for managers in the AI era</i>	53
7.	<i>Lifelong learning; adult learning</i>	54
8.	<i>Elements of digital learning</i>	57
9.	<i>Social acceptance of AI and digitalisation</i>	59
E.	IMPACT OF AI BY COUNTRY	62
I.	Exposure and complementarity by country	62
II.	Fears of job loss: contrasts between East and West	63
III.	AI Economic Impact Index (winners/losers by country)	64
IV.	Key factors for successful countries	65
1.	<i>Life-long learning and digital literacy of employees</i>	65
A)	INCORPORATION OF DIGITAL TECHNOLOGIES INTO DAILY LIVES	66
B)	DIGITAL ECONOMY IN ADMINISTRATION	67
2.	<i>Public and private investments</i>	68
3.	<i>Connectivity through high-speed internet</i>	69
F.	THE IMPACT OF DIGITALISATION/AI ON EMPLOYMENT RELATIONSHIPS	70
I.	Hiring processes	71
1.	<i>GDPR and application processes</i>	71
2.	<i>E-recruiting</i>	72
3.	<i>Applicant screening via social media</i>	73
4.	<i>Background checks under EU law</i>	74
II.	Existing employment relationships	75
1.	<i>Practical use cases for AI in HR processes</i>	75
2.	<i>Big Brother is watching you</i>	76

A)	ACCESS CONTROL	78
B)	VIDEO SURVEILLANCE	78
C)	COMMUNICATION MONITORING	79
3.	<i>Working hours</i>	80
A)	AN OVERVIEW OF WORKING TIME LAW	81
B)	ANNUAL WORKING TIME TO ACHIEVE FLEXIBILITY	82
C)	OPT-OUT MODELS TO ACHIEVE FLEXIBILITY	83
D)	EXCLUSION OF CERTAIN GROUPS OF WORKERS	83
E)	TIME RECORDING RULING AND IMPLEMENTATION	85
F)	OPINION OF UNIONS AS TO FLEXIBLE WORKING HOURS	86
G)	NECESSARY CHANGES	87
AA)	MAXIMUM WORKING HOURS	87
BB)	BREAKS AND REST PERIODS	88
CC)	FLEXIBILITY AND BOUNDARIES BETWEEN FREE TIME AND WORKING TIME	89
H)	CONCLUSION	89
III.	Terminations due to LDT	90
G.	NEW STRUCTURES IN COMPANIES	91
I.	Work from anywhere, anytime with fewer hierarchy levels	91
II.	Remote work on the rise: benefits and challenges	93
1.	<i>Overview of the benefits of remote work from the parties' perspectives</i>	93
2.	<i>Overview of the challenges of remote work from the parties' perspectives</i>	94
3.	<i>Addressing remote work challenges</i>	95
4.	<i>Alienation or bonding through remote work?</i>	96
A)	COMMUNICATION AS A UNIFYING FACTOR	96

B)	ALTERNATING REMOTE WORK	97
5.	<i>Remote work: risk of offshoring</i>	97
6.	<i>Productivity in remote work environments</i>	98
III.	Remuneration structures	99
IV.	Empowerment of employees	100
1.	<i>Agile work</i>	100
A)	SCRUM: AN AGILE WORKING METHODOLOGY	101
B)	BENEFITS OF AGILE WORK	101
C)	CHALLENGES OF AGILE WORK	102
D)	ADDRESSING AGILE WORK CHALLENGES	102
2.	<i>Leading by KPIs instead of micromanaging</i>	103
V.	Changes in Working Environment of Employees due to AI and Robotics	104
1.	<i>Robots and AI as coworkers</i>	104
2.	<i>AI as a supervisor</i>	105
3.	<i>Changing role of managers</i>	106
A)	NEW TASKS FOR MANAGERS	106
B)	ALGORITHMS AS DECISION-MAKING ASSISTANTS	107
C)	DOES AI MAKE NON-DISCRIMINATORY DECISIONS?	108
H.	NEW WORKING FORMS AND THEIR CLASSIFICATION	110
I.	Types of platforms	111
II.	Classification of groups of workers	113
1.	<i>Contractual structure</i>	113
2.	<i>Legal consequences of false classifications</i>	114
3.	<i>Employees and independent contractors</i>	115
4.	<i>Dos and don'ts</i>	117

III.	Prohibition of secondary employment/exclusivity clauses	119
IV.	Alternative solutions without expanding employment scope	120
	1. <i>European Directive on Transparent and Predictable Working Conditions</i>	120
	2. <i>Adapting/introducing social security systems</i>	121
I.	SOCIAL MEDIA IN COMPANIES	122
I.	Use of social media by employees	122
II.	Use of social media by employee representatives	123
III.	Use of wearables, apps, and nudging/control devices	124
	1. <i>Employee Data Protection</i>	124
	2. <i>Statutory criteria of permissibility</i>	125
	3. <i>Participation rights of employee representatives</i>	125
J.	HOMEWORK FOR POLICYMAKERS: CREATE A FLEXIBLE AND UP-TO-DATE LEGAL FRAMEWORK	126
I.	Role of legal frameworks	127
II.	Debureaucratisation	128
III.	Establish new social systems	129
IV.	Create an open-minded attitude toward AI	130
V.	Outlook	131

A. KEY FINDINGS OF GEI REPORT, PART I (APRIL 2017)

While the first part of the report primarily described the immediate future, this second part of the report aims to provide an update on the far-reaching impact of the digital transformation on the rapidly changing labour market and labour relations, as well as on labour and employment law issues. Please note that the report is based on the legal situation in the European Union as it relates to these issues unless explicitly stated otherwise.

The key findings of our last report were as follows:

- digitalisation affects the blue-collar and the white-collar sectors alike;
- there will be new company structures, new forms of work and an increase in the number of self-employed persons/freelancers;
- mass unemployment is a realistic scenario in certain branches. Jobs at all levels presently undertaken by humans are at risk and many tasks will change significantly; and
- labour and employment laws are lagging behind the reality in business, and the gap is increasing. Some legislation once in place to protect workers may be no longer fit for purpose.

B. EXECUTIVE SUMMARY OF THIS GEI REPORT

Much in the world of artificial intelligence (AI), digitalisation and the modern working world is still uncertain and will only become clear over time. It is a fact, however, that companies and workers are being affected by **new forms of employment and changing structures** at a **velocity** the world has not seen before.¹ **Digitalisation** (and automation) is a **global phenomenon** affecting all sectors around the world. AI is completely redefining the working world.² Due to these changes, work itself will be redefined, and many jobs must be shifted to other sectors. Among the sectors most affected will be the routine service sector, with its focus on medium skills.

While **flexibility** and **adaptability** to the changing reality in **labour and employment law** would be desirable, **internationally consistent rules** should be established for responding to **digitalisation in labour and employment law**. At present, there is still a patchwork of national regulations and international guidelines (in some cases non-binding) that often stand in the way of technical opportunities and make incorporating AI into the labour market difficult.

I. Digitalisation, AI (automation), and their effect on labour markets

- Large action models (LAMs) represent the next generation of generative AI. They surpass large language models (LLMs) by executing actions derived from natural language inputs. The integration of LAMs into humanoid robots will be the next revolution in the workplace.
- Generative AI, as a general-purpose technology (GPT), has the potential to drive substantial productivity gains and wealth accumulation, akin to historical GPTs such as the steam engine and the internet.
- The economic effects of AI include enhanced labour productivity, capital utilisation and automation, which collectively contribute to increased economic growth. However, this growth is accompanied by an exacerbation of income inequality. Automation also fosters innovation in automated services and business models, which impacts various industries.
- AI evolution unfolds in waves: classical AI automating simple tasks; generative AI revolutionising content production; and future autonomous AI automating physical work.
- Generative AI has the potential to increase employee performance by up to 40 per cent.

1 See [www.europarl.europa.eu/RegData/etudes/STUD/2021/662911/IPOL_STU\(2021\)662911_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2021/662911/IPOL_STU(2021)662911_EN.pdf) (last accessed on 3 September 2024).

2 See <https://calldesk.ai/blog/robot-customer-service> (last accessed on 3 September 2024).

- The best results are achieved when employees are trained in the use of AI beforehand.
- Assessments of the impact of AI on employment take into account the exposure – looking mainly at labour-displacing technology (LDT) – and complementarity of occupations, in a totally new approach triggered by the advent of generative AI tools (eg, ChatGPT).
- Exposure to AI is a measure of the degree of overlap between AI applications and the previously required human skills in each occupation. It refers to the possibility of AI being a labour-displacing technology.
- Complementarity takes the social, ethical and physical context of occupations as well as the skill level required into account. The index reflects the degree to which an occupation is likely to be complemented by AI.
- High-exposure, high-complementarity occupations, such as surgeons, may benefit from AI assistance, while high-exposure, low-complementarity occupations, such as telemarketers, face a higher risk of displacement by technology.
- Occupations with high complementarity to AI are more concentrated in the upper-income percentiles, suggesting that the benefits of AI may accrue disproportionately to higher earners.
- The potential for automation cannot be equated with actual expected job losses or employment effects. The main reasons for this are technological diffusion, employee flexibility and compensation mechanisms.
- The anticipated technological advancements are projected to enhance overall employment by reducing production costs, stimulating demand and expanding job opportunities across industries.
- Three forms of jobs will be in demand due to advancing technologies: frontier work, last-mile work and wealth work. Technology adoption will create jobs, particularly in the IT sector but not limited to it; jobs that do not yet exist will be created in all sectors and redefine the role of human workers.
- AI boosts job value, requiring highly qualified, well-trained employees who embrace lifelong (digital) learning or (re)training.
- Awareness of sustainability and social responsibility as well as demographic changes are impacting labour markets.
- Labour market polarisation: wages will rise for low and high-skill jobs, while jobs with moderate skills will decline due to digitalisation; generational

tech attitudes provide an advantage to tech-savvy younger workers; and demographic changes present both obstacles and opportunities for digitalisation by offsetting potential rationalisation effects.

- Successful adaptation to the automation and AI era requires business leaders to understand the potential of these technologies, strategically plan workforce transitions, prioritise talent development, and engage in executive education on automation technologies.

II. Impact by country

- Recent surveys suggest that automation, excluding generative AI, could take over 21.5 per cent of working hours in the United States economy by 2030, rising to 29.5 per cent with generative AI; in Europe, this figure could reach 27 per cent.
- In advanced economies, with their high proportion of low and high complementarity occupations, the introduction of AI may lead to more pronounced shifts in the labour market, with risks of displacement in some occupations and opportunities for growth in others, while low-income countries may see less impact due to fewer high exposure occupations.
- Western workers are less worried than their Asian counterparts. This shows that they need to be more aware and learn digital skills.
- This confidence in their abilities may be an example of the Dunning-Kruger effect, with many overestimating their abilities and underestimating the abilities of AI.
- The US leads the AI Economic Impact Index due to substantial public and private R&D investment and a rapidly expanding higher education system; the index assesses which economies are best positioned to benefit from AI over the next few decades, using 40 sub-indicators to evaluate three critical factors – innovation, diffusion and adaptation.
- Emerging markets, particularly outside Asia, rank lower due to low private-sector dynamism, underdeveloped IT sectors, limited R&D investment and brain drain, hindering technological innovation.
- AI could exacerbate economic disparities between low-income and highly developed countries, though AI adoption in emerging markets could address skills shortages and boost productivity in areas like healthcare and education.
- China will excel in some areas but face challenges in others, potentially becoming a new fault line in the global economy.

- Lifelong learning and digital literacy will be crucial for workers, with an emphasis on non-formal qualifications and fundamental technical knowledge to check and implement AI-provided information.
- Governments and companies need to invest heavily in AI, with the US leading the world in both public and private investment, followed by China and the United Kingdom.
- Connectivity through high-speed internet is essential for a digital economy, with efficient digital infrastructure and widespread 5G networks necessary for technologies like autonomous driving.

III. The impact of digitalisation/AI on employment relationships

- Digitalisation and AI are fundamentally changing all aspects of employment relationships, from hiring to firing. For example, companies are using e-recruiting via AI and background checks via social media.
- Human resources (HR) processes are highly dependent on automation and AI.
- AI is being applied across various HR functions, including remuneration planning, workforce planning and employee development.
- Companies focus on determining current and future personnel needs, identifying skill gaps, and deciding on internal development or external recruitment.
- The increasing use of technological tools to monitor employees, such as performance monitoring software, can raise concerns regarding privacy and employee rights.
- Legal requirements for employee monitoring vary depending on the type of monitoring and between European countries.
- It is important to involve employee representatives in the implementation of monitoring measures and to respect employees' general right to privacy.
- Labour and employment laws were originally enacted to protect workers' health and prevent exploitation but are often ill-suited to the flexible digital work environment, where a skills shortage has changed the power dynamics.
- AI/digitalisation supports flexible working hours, challenging traditional regulations on working hours and rest periods, with varying approaches in different countries.

IV. New structures in companies

- Digitalisation has enabled remote work, which has revolutionised the traditional workplace by allowing employees to perform their duties from locations outside the traditional office environment.
- While remote work has many benefits, it also presents challenges that need to be addressed.
- Communication is critical to preventing alienation, fostering team cohesion in a remote work environment, and maintaining loyalty to the employer.
- Addressing remote work challenges requires voluntariness, participation and balance, ensuring clear rules on work hours and employee participation rights.
- Whether remote working increases or decreases productivity depends on the individual situation of the employee and the company.
- Under certain circumstances, allowing for remote work can create a risk of offshoring for the employee.
- Variable remuneration structures are increasingly being adopted, focusing on performance rather than hours worked, offering employees flexibility and transparency in compensation.
- The future of work means empowering employees. By embracing agile working and reducing micromanagement, hierarchies are broken down and the worker is transformed from executor to creator.
- Managers' roles are evolving from directive to facilitative, emphasising social skills, networking, and global coordination, with AI assisting in decision-making and task allocation.
- Robots and AI are changing the work environment by becoming colleagues and supervisors.

V. New working forms and their classification

- Companies are moving away from traditional employment structures, opting for platforms to outsource activities.
- The gig economy in the EU is expected to grow to 43 million people by 2025. Platform workers, often part time, earn hourly rates around Western minimum wages, prompting concerns about job insecurity and tax and social security issues.

- The EU estimates that five million platform workers are misclassified as self-employed, lacking proper worker protections.
- The European Council and Parliament have agreed on a directive to improve working conditions for platform workers, introducing a rebuttable presumption of employment if certain control criteria are met.
- The platform economy offers flexibility and opportunities, especially for those who cannot work conventionally, but also presents risks of precarious working conditions and legal uncertainties.
- Gig work straddles the line between a service relationship and an employment relationship. Misclassification can have considerable legal consequences.
- Companies must avoid misclassification by implementing clear payment structures and contractual arrangements, as well as by avoiding exerting control over workers.
- EU legislation now prohibits exclusivity clauses, allowing workers to take up secondary employment, emphasising the importance of confidentiality agreements.
- An EU framework for gig workers is in the making to ensure minimum wages, working time regulations, social security, pensions, taxation and other rights.

VI. Social media in companies

- Social media is increasingly being used by companies for marketing because of its vital role in global networking. Depending on the product, social media channels can reach more potential buyers than traditional advertising, blurring the line between personal and commercial use.
- The increasing role of social media in companies requires employers to balance their interests with employees' freedom of expression and personal rights. Employee participation rights need to be respected.
- The use of social media by employees and their representatives can strengthen employee causes by building public support. Online agitation is the newest form of industrial action, but social media also keeps management informed and allows employers to communicate through their own channels.
- The use of wearables in the workplace requires strict adherence to General Data Protection Regulation (GDPR) provisions, including obtaining voluntary consent from employees and justifying data processing based on necessity and proportionality, while also considering the participation rights of employee representatives and uniform data protection standards.

VII. Challenge for policymakers: a flexible and up-to-date legal framework

- With the increasing integration of digital technologies and AI into the workplace, there is a growing need for a comprehensive legal framework to regulate various aspects such as autonomous systems, data responsibility, intellectual property rights, business law and personal data protection.
- The European Commission's current regulation aims to shape future work and focuses on the integration of AI, working conditions and data protection, with the guidelines on AI liability focusing on transparency and accountability.
- Policymakers must create flexible and up-to-date legal frameworks to address the challenges posed by digitalisation and automation. The laws should be forward-looking, adaptable to technological changes, and structured to allow for quick interpretation and amendments.
- Strict regulations regarding working time, requirements for a wet-ink signature, and an extended definition of who is an employee versus a freelancer hinder flexibility and are mostly not in the interest of workers.
- Likewise, flexible laws to support changes in social systems are essential. Suggestions include improving social security for the self-employed and exploring options such as unconditional basic income or taxes on robots and digital services.
- To create an open atmosphere for AI integration in the workplace, labour and employment laws need to be adapted to comply with data protection regulations while accommodating new technologies.
- Legislative efforts to address the challenges and opportunities presented by digitalisation and AI integration are expected to continue, with a focus on innovation, flexibility and ethical considerations.

C. OVERVIEW: KEY FACTORS AND CHALLENGES

Key factors and challenges in the future labour market are digitalisation, automation, AI, skill gaps, gig work, and social, environmental and demographic changes.³

I. Digitalisation

Digitalisation is a key factor in the future labour market for several reasons. Here are some of the main ways it is impacting the nature of work.

- **Increased productivity:** Digitalisation, using software and automation, can greatly increase productivity. Routine tasks can be automated, leaving workers to concentrate on higher-value activities that require human skills such as creativity, problem-solving and critical thinking. This can lead to more output with less input, enhancing the overall productivity of an organisation.⁴
- **New job creation:** While there are legitimate concerns about digitalisation leading to job displacement, it is important to remember that it also creates new jobs. These range from roles directly linked to the tech sector, like software developers and data scientists, to roles that did not exist before digitalisation, like social media managers and user experience (UX) designers.⁵
- **Flexibility and remote work:** Digital tools and platforms make it possible for people to work from virtually anywhere, leading to a rise in remote and flexible working arrangements.⁶
- **Risk of outsourcing/offshoring work:** Digitalisation has made it possible for certain activities to be performed by people around the world at any time. Portals such as Upwork, Fiverr and Twago connect clients with freelancers around the world who can translate texts, program websites, or improve a company's visibility on the internet. The digitalisation of outsourcing brings with it the risk of job losses domestically.
- **Increased innovation:** Digitalisation can spur innovation by enabling rapid experimentation, facilitating collaboration, and providing new tools and

3 See [www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2021\)679097](http://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2021)679097) (last accessed on 3 September 2024).

4 See www.ecb.europa.eu/pub/economic-bulletin/focus/2018/html/ecb.ebbox201807_04.en.html (last accessed on 3 September 2024).

5 See www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf, 24 ff (last accessed on 3 September 2024).

6 See www.forbes.com/sites/theyec/2020/05/14/flexibility-and-digitalisation-the-keys-to-a-productive-remote-workforce/?sh=6f5003f91e07 (last accessed on 3 September 2024).

techniques for problem-solving. This can create a competitive advantage for businesses and drive economic growth.⁷

- **Data-driven decision-making:** With digitalisation comes the ability to collect and analyse vast amounts of data. This allows for more informed and effective decision-making, which can have a profound impact on a company's success.⁸
- **Dematerialisation:** Due to automatic data collection and processing, traditional back-office tasks will be less in demand in the future. Autonomous software collects the necessary information and sends it to the appropriate departments. Dematerialisation also leads to the digitalisation of traditionally physical assets. For example, conventional entry tickets, travel tickets and cash have begun to be replaced by digital alternatives such as contactless payment methods. Today, currencies exist more in a virtual space than in a material one.⁹

II. Automation/robotisation

As a result of advances in technology, robots have steadily replaced workers in manufacturing since the 20th century because they are more accurate and cost less than workers. Creative solutions such as 3D printers and the ability of these manufacturing robots to self-learn will replace human labour in the long run. As technology develops, production robots continue to evolve in such a way that they can also be used for more demanding work and for individual production.¹⁰ In addition, there is no longer any separation between human workers and machines: so-called cobots work hand in hand with their human operator and allow for a larger production spectrum.

Automation is regarded as a key factor for several reasons listed below.

- **Connectivity/Internet of Things (IoT):** Connectivity allows different systems to communicate with each other, for example allowing self-driving cars to detect their environment (using sensors) and act in coordination with other systems. By interconnecting with other systems, an intelligent system can make independent decisions and complete entire processes without human intervention.¹¹ The physical size of the devices that perform

7 Download at <https://op.europa.eu/en/publication-detail/-/publication/203fa0ec-e742-11ea-ad25-01aa75ed71a1/language-en> (last accessed on 3 September 2024).

8 See www.forbes.com/sites/tableau/2022/09/23/beyond-the-buzzword-what-does-data-driven-decision-making-really-mean/?sh=7856893425d6 (last accessed on 3 September 2024).

9 See Apple Car Keys noch eine Rarität: App soll Autoherstellern beim Testen helfen | heise online (last accessed on 3 September 2024).

10 See www.springerprofessional.de/industriroboter/industrie-4-0/roboter-uebernehmen-die-welt-der-produktion/15236792 (last accessed on 3 September 2024).

11 See www.iotttechnews.com/news/2018/jul/09/sense-and-sensor-ability-how-ai-and-connectivity-will-help-each-other-grow/ (last accessed on 3 September 2024).

this work is decreasing, while their performance (speed, capacity and data transmission rate) and connectivity are increasing. If software makes an error, all connected systems will note this and avoid the same error next time, a form of swarm intelligence.¹²

- **Efficiency and productivity:** Automation technologies can perform tasks much more quickly and accurately than humans, especially repetitive tasks. This increased efficiency and productivity can help companies reduce costs, improve quality and increase output.¹³
- **24/7 operations:** Automated systems can work around the clock without the need for breaks, holidays or sick leave. This allows companies to operate continuously, maximising their production capabilities.¹⁴
- **Safety:** In industries with potentially hazardous working conditions – like mining, construction and certain types of manufacturing – automation can greatly reduce risks to human workers by relieving them of dangerous tasks.¹⁵
- **Overcoming labour shortages:** In some sectors, automation can fill labour shortages, providing consistent, high-quality work that may be difficult to achieve with a human workforce.¹⁶

III. Artificial intelligence

Another key factor in the future labour market is artificial intelligence (AI). Already, 79 per cent of executives surveyed said they are using three or more types of AI applications to their fullest extent.¹⁷

The AI Act agreed by the Council and the EU Parliament, which entered into force on 1 August 2024, defines the term ‘artificial intelligence system’ (**AI system**) as:

‘A machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how

12 See www.spiegel.de/spiegel/print/d-150343281.html (last accessed on 3 September 2024).

13 See www.winman.com/blog/automated-processes-for-better-quality-productivity-and-efficiency (last accessed on 3 September 2024).

14 See www.robots.com/articles/benefits-of-robots#:~:text=Robotsper cent20andper cent20Productivity&text=Theyper cent20canper cent20workper cent20atper cent20a,withper cent20moreper cent20repeatabilityper cent20thanper cent20humans. (last accessed on 3 September 2024).

15 See www.winman.com/blog/automated-processes-for-better-quality-productivity-and-efficiency (last accessed on 3 September 2024).

16 See www.weforum.org/agenda/2023/01/how-automation-will-pull-us-through-the-labour-shortage-davos23/ (last accessed on 3 September 2024).

17 See www2.deloitte.com/content/dam/Deloitte/us/Documents/deloitte-analytics/us-ai-institute-state-of-ai-fifth-edition.pdf (last accessed on 3 September 2024).

to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.¹⁸

AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions.¹⁹ AI continuously learns new things, can make decisions based on its own experience and can now be found everywhere: AI greets us on our smartphones, influences our buying behaviour, and finds out what news we find most interesting. Especially since the introduction of the ChatGPT AI tool, the whole world has been talking about AI and its effects on the future of work. Recent surveys suggest that **human-level AI** will exist **by the 2060s**, and that **within the next 100 years** there is a **50 per cent chance** that **AI** will be able to perform **any task more effectively and cheaply** than humans.²⁰ This impact on productivity is expected to add the equivalent of US\$2.6–4.4tn annually to the world economy.²¹ The current global GDP of around US\$100tn (2022)²² would thus increase by 2.6 per cent to 4.4 per cent as a result. The use of AI in the future labour market could have the following advantages:

- development of **new business models**;
- more transparent **fact-based decision-making**;
- **added value** by collating data;
- **rationalisation of operations**;
- more **efficient allocation of resources**; and
- higher **productivity**.

IV. Skill gaps

Skill gaps describe the phenomenon in which the skill level of workers is insufficient to meet the requirements of their current job. Skill gaps have the potential to harm productivity at the company level. This means that either more workers are needed, or higher recruitment or training costs are incurred, meaning that skill gaps drive up average labour costs.²³

18 Art 3 (1), Final draft of AI regulation by EU Council and European Parliament. Download here: <https://artificialintelligenceact.eu/de/das-gesetz/> (last accessed on 3 September 2024).

19 See www.aepd.es/sites/default/files/2019-12/ai-definition.pdf (last accessed on 3 September 2024).

20 See <https://ourworldindata.org/ai-timelines> (last accessed on 3 September 2024).

21 The economic potential of generative AI (McKinsey). Download at www.mckinsey.com/capabilities/mckinsey-digital/our-insights/The-economic-potential-of-generative-AI-The-next-productivity-frontier#/ (last accessed on 3 September 2024).

22 See <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD> (last accessed on 3 September 2024).

23 See <https://docs.isa.org/dp9278.pdf> (last accessed on 3 September 2024).

Digitalisation will make skill gaps a problem for the labour market of the future, as it leads to an accelerating shift in the types of skills in demand. The automation of tasks will lead to a **demand** for a **range of new skills**. Digital skills, such as proficiency with digital tools and platforms, data analysis and digital marketing, are becoming increasingly important.²⁴

In 2019, almost nine out of ten executives and managers worldwide stated that their companies either already faced skills gaps or expected to face skills gaps in the next five years. Most frequently, they expect or experience skill gaps in data analysis and IT management, both of which are a consequence of ongoing digitalisation.²⁵ **Attracting and retaining AI talent** is also a challenge everywhere. For example, in China, more than half of companies were already struggling to fill AI roles in 2022. Six million AI-related jobs are expected in China in 2030 – four million more than in 2023 – while the number of AI talents is only to reach two million by then.²⁶ To close skills gaps, companies must first **identify them through well-developed processes** – for example, by means of performance assessments, job descriptions and advice on job changes. The most effective way to do this is to foster a culture of lifelong learning. At the moment, two-thirds of companies are hiring to prepare for potential skills gaps, some have made efforts, but only a third of companies have already started retraining. While in North America and Asia new employees are primarily hired to close skills gaps, the focus in Europe is more on retraining.²⁷

At the same time, **soft skills** among real workers will continue to be highly valued. In this respect, AI will only be used as a tool to support and enhance human creativity rather than replace it completely. Human creativity, critical thinking, and the ability to understand and empathise with complex emotions and experiences remain key strengths that **AI will struggle to fully emulate**.²⁸

V. Gig work

- The new generation of workers is increasingly taking to **self-employment** via apps and platforms (**'work on demand'**).²⁹ This work is performed by an **increasing number of freelancers** spread all over the world. For instance, the number of freelancers in the US is expected to rise from 57.3 million in 2017 to 90.1 million in 2028.³⁰

24 See www.mckinsey.com/capabilities/people-and-organisational-performance/our-insights/beyond-hiring-how-companies-are-reskilling-to-address-talent-gaps (last accessed on 3 September 2024).

25 *Ibid.*

26 See www.shrm.org/resourcesandtools/hr-topics/organisational-and-employee-development/pages/ai-is-changing-the-skills-employers-want-from-workers.aspx (last accessed on 3 September 2024).

27 See n 24 above.

28 See n 5 above, 37.

29 See <https://hrforecast.com/what-is-the-gig-economy-and-why-is-it-the-future-of-work/> (last accessed on 3 September 2024).

30 See www.statista.com/statistics/921593/gig-economy-number-of-freelancers-us/ (last accessed on 3 September 2024).

Globally, approximately 1.57 billion people are freelancers.³¹ Traditional employment relationships are less common. Platform work has become especially popular since the Covid-19 pandemic. In 2020 – the first year of the pandemic – the US gig economy grew 33 per cent: 8.25 times faster than the overall US economy.³²

VI. Social, environmental and demographic changes

Technological changes are not the only important challenges for the future labour market: social and environmental changes must not be neglected.

- **Sustainability and environmental consciousness:** Businesses must be environmentally responsible due to changes in public sentiment and government regulations. This pushes companies to invest in green technologies and sustainable practices. Therefore, jobs in the environmental sector (eg, renewable energy, environmental science technicians) are projected to increase.³³
- **The environmental challenges posed by AI:** Data centres have an infinite hunger for energy and water. The combined energy demand of the US tech companies Microsoft, Google, and Meta is higher than that of BASF or Switzerland.
- **Social awareness and responsibility:** Modern society places a higher value on businesses that operate ethically and transparently, and that contribute to the well-being of society. This increases demand for positions that focus on corporate social responsibility, diversity and inclusion, social impact assessments, and more.³⁴
- **Demographic changes:** In many countries, the population is continuing to age; by 2050, around one in four people in Europe and North America will be of retirement age. Some countries in Asia – including Japan, South Korea and China – are also experiencing similar demographic trends.³⁵ This development is creating **labour shortages** in certain sectors and **a greater demand for healthcare and social support roles**.³⁶
- **Millennials:** At the same time, younger generations are becoming more globally connected, digitally literate, and socially and

31 See 57+ Freelance Statistics, Trends and Insights (2023) (explodingtopics.com) (last accessed on 3 September 2024).

32 See https://smallbiztrends.com/2021/10/covid-gig-economy-statistics.html?utm_content=cmp-true (last accessed on 3 September 2024).

33 See <https://action.deloitte.com/insight/3340/an-overview-of-green-job-growth> (last accessed on 3 September 2024).

34 See www.businessnewsdaily.com/4679-corporate-social-responsibility.html (last accessed on 3 September 2024).

35 See www.nzz.ch/international/demografischer-wandel-7-prognosen-zur-weltbevoelkerung-2050-ld.1626318 (last accessed on 3 September 2024).

36 See https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/new-push-european-democracy/impact-demographic-change-europe_en (last accessed on 3 September 2024).

environmentally conscious, which affects the types of roles they seek and the work environments they prefer.

- **Globalisation and migration:** These phenomena are leading to more culturally and linguistically diverse societies. In the labour market, this translates into a demand for workers who can navigate these diverse environments effectively, necessitating skills such as cross-cultural communication and understanding.³⁷
- **Regulations and policies:** Governments are implementing policies and regulations to tackle social and environmental issues, which in turn influence the labour market. For instance, regulations promoting renewable energy use can spur job growth in that sector.³⁸ The labour market is affected by social and environmental changes. About **3.5 million jobs** could be **lost in the US alone**. At the macro level, however, these losses are likely to be more than offset by **gains of 4.2 million jobs**, mainly due to investment in renewable energy.³⁹

37 See www.g2.com/articles/what-is-cross-cultural-communication (last accessed on 3 September 2024).

38 See <https://assets.kpmg.com/content/dam/kpmg/vn/pdf/Legal-Update/2022/3/Legal-Alert-New-regulations-on-environment-protection-EN.pdf> (last accessed on 3 September 2024).

39 Generative AI and the future of work in America (McKinsey). Download at www.mckinsey.com/mgi/our-research/generative-ai-and-the-future-of-work-in-america (last accessed on 3 September 2024).

D. DIGITALISATION, AI (AUTOMATION) AND THEIR EFFECT ON LABOUR MARKETS

Although digitalisation is widely considered important,⁴⁰ it is currently **not yet sufficiently implemented**. In 2021, **only 55 per cent** of small and medium-sized enterprises in the EU reached at least a basic level in the adoption of digital technologies. Although 34 per cent of enterprises in the EU already used cloud computing, only eight per cent used AI and 14 per cent used big data.⁴¹ This has undergone a rapid acceleration in the last two years. In a recent study, 46 per cent of respondents said that they have experimented with generative AI while 27 per cent said that they use it regularly. There is a large discrepancy in regular AI use between leaders (80 per cent) and frontline employees (20 per cent).⁴²

However, in the future, companies will make much more extensive use of opportunities for digitalisation. As a result, digitalisation will also lead to radical change in a country's competitive landscape.

I. Overview: generative AI

AI, and generative AI in particular, is a **general-purpose technology (GPT)**. We talk about GPTs when a certain technology has led to **substantial productivity gains** in many industries and has caused people's wealth to increase significantly. Historically, there are not many of these technologies. They include the steam engine, the railroad, electricity, the computer and the internet.⁴³

The implementation of generative AI has two main economic effects. One is a **productivity effect** and the other is an **innovation effect**. The productivity effect means that the labour productivity of workers engaged in cognitive activities increases. Companies can substitute capital for some of their labour. Therefore, companies with a high proportion of cognitive activities have great potential for productivity gains and can be considered **winners of AI automation**. The situation is similar for companies with a high share of research and development. Both types of companies are therefore already valued higher by the stock market in anticipation of AI automation.⁴⁴

40 See www2.deloitte.com/content/dam/Deloitte/us/Documents/deloitte-analytics/us-ai-institute-state-of-ai-fifth-edition.pdf (last accessed on 3 September 2024).

41 Digital Economy and Society Index 2022. Download at <https://digital-strategy.ec.europa.eu/en/policies/desi> (last accessed on 3 September 2024).

42 See www.bcg.com/publications/2023/what-people-are-saying-about-ai-at-work (last accessed on 3 September 2024).

43 See www.netzoekonom.de/kuenstliche-intelligenz-vortrag/ (last accessed on 3 September 2024).

44 *Ibid.*

The **innovation effect** is the development of new digital business models in the form of **automated services**, such as the production of text, video and images. On the market, this will lead to a situation in which the high-price segment will be handled by a human and the low-price segment will be handled by AI. **Cloud computing** will also become more important. AI will also lead to innovative companies entering sectors with high generative AI exposure, for example the IT, tax and legal markets.⁴⁵

In macroeconomic terms, generative AI will increase labour productivity, capital utilisation, automation and the use of robots. It will also boost economic growth. However, the distribution of income will become more unequal.⁴⁶

1. *General impacts of generative AI*

There are three key impacts of generative AI on industries generally: **cost reduction potential**, **competitive risk** and **revenue potential**. These potentials overlap in many industries. For example, the media industry has significant revenue and cost reduction potential due to the ability to create content using generative AI. At the same time, this industry is facing enormous competition from other media companies to see who can exploit the potential of generative AI faster and more effectively.

2. *AI automation waves*

The evolution of AI can be divided into **three successive waves**, each representing a different aspect of automation and intelligence.

The first wave, the **classical AI wave**, was characterised by the automation of simple, programmable tasks and the analysis of **structured data**. This was applied primarily in sectors such as finance, information and communications. Companies used this technology to streamline processes and analyse data to make informed decisions.

Today, we are in the midst of the **generative AI wave**, which includes the automated analysis of **unstructured data and the automated production of content**, be it text, images or even software. This phase of AI development is enabling companies to automate creative tasks and develop AI-based business models centred around content generation.

The next wave, the **AI autonomy wave**, is on the horizon and is expected to gain momentum around 2030. In this phase, the focus will be on **automating physical work outside of controlled environments**. Examples include

45 *Ibid.*

46 *Ibid.*

autonomous vehicles and service robots capable of performing tasks without constant human supervision. This development has the potential to fundamentally change the way we work and live.

3. Areas of application for generative AI

Currently, generative AI is mainly used in the following areas:

- software development;
- marketing;
- customer service (chatbots, call centres); and
- sales.

In contrast, generative AI is not yet widely used in the areas of law and finance.

In three to five years, generative AI is expected to be used in the following areas:⁴⁷

- data analysis;
- creation of marketing content;
- creation of customer and competitor information;
- document processing;
- customer care; and
- automated mailings.

AI is also more likely to be used in areas such as drafting contracts.

4. Increasing productivity through AI

A study examining the impact of generative AI on highly skilled workers revealed that when AI operates within its defined capabilities, it can **enhance a worker's performance by up to 40 per cent** compared to those not utilising it.⁴⁸

In this study, participants were divided into **two groups**: one received tasks suited to **GPT-4's strengths**, while the other received tasks designed

47 See www.businesswire.com/news/home/20231012307573/en/Generative-AI-Hits-the-Mainstream-New-Survey-Reveals-the-Majority-of-Enterprise-Leaders-Have-Now-Adopted-AI-and-Plan-to-Increase-Investments-in-Next-Year (last accessed on 3 September 2024).

48 Download at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4573321&download=yes (last accessed on 3 September 2024).

to **exceed GPT-4's capabilities**. Each group was further split into three subgroups: one with no AI access, one with access to GPT-4, and one with access to GPT-4 and usage guidance.⁴⁹

The **'inside the frontier' group**, tasked with developing a new shoe product, showed a positive impact from AI. Those using GPT-4 alone saw an **increase in performance of 38 per cent** over the control group, and those with guidance saw a **42.5 per cent increase**. Notably, participants with lower skill levels saw a 43 per cent boost with GPT-4, compared to a 17 per cent boost for higher-skilled participants.⁵⁰ In contrast, the **'outside the frontier' group**, tasked with recommending brand investments, saw negative effects from AI. The GPT-only subgroup had a 13 per cent performance decrease, and those with guidance had a 24 per cent decrease. Participants in this group tended to follow AI recommendations regardless of accuracy, lowering their performance, though their justification quality improved.⁵¹

5. *Next stage of development: large action models (LAM)*

The **next stage** of generative AI evolution is the **large action model (LAM)**. LAMs represent an advancement over **large language models (LLMs)**, building on their capabilities. While traditional language models like ChatGPT primarily interpret natural language inputs and generate text-based outputs, LAMs extend this functionality by not only processing instructions but also **executing actions** derived from them. In essence, LAMs act as agents capable of autonomously performing tasks. The impetus behind LAMs comes from interacting with software applications, which predominantly utilise **graphical user interfaces (GUIs)**. Users engage with GUIs on a daily basis, such as when booking a hotel room. LAMs mimic this interaction by learning tasks through a single demonstration (known as **'one-shot learning'**) and subsequently autonomously performing them upon request. LAMs find use in AI-based assistance systems, notably in scenarios like operating applications while driving. They gained prominence through initiatives like **Rabbit's 'rabbit OS'**,⁵² an operating system driven primarily by voice commands and trained through human interaction data to interact with existing apps. Another example is Deutsche Telekom's proposed **'Concept AI Phone'**,⁵³ which aims to operate without traditional apps, following a similar trajectory. Leveraging neurosymbolic models, LAMs combine the

49 *Ibid.*

50 *Ibid.*

51 *Ibid.*

52 See www.rabbit.tech/research (last accessed on 3 September 2024).

53 See www.telekom.com/de/medien/medieninformationen/detail/telekom-befreit-smartphones-von-apps-1060268 (last accessed on 3 September 2024).

linguistic efficiency of neural network-based language models with the decision-making logic of symbolic models.⁵⁴

Neurosymbolic AI is an approach that integrates neural networks with symbolic AI. Neural networks excel at working with **unstructured data**, such as images, text and audio, while symbolic AI is better suited for logical reasoning and decision-making based on rules and logic. Neurosymbolic AI approaches aim to harness the advantages of both paradigms, enabling the system to understand unstructured inputs, such as natural language, and draw logical conclusions. This ensures adherence to predefined logic, such as ensuring goods are paid for before being issued. While language models alone are limited in their ability to operate software applications, LAMs bridge this gap by mapping software application interactions into a format understandable to the model, such as text, sequences or images. Many commentators view LAMs as the next major advancement after LLMs, potentially paving the way towards **artificial general intelligence (AGI)**. The value proposition of LAMs lies in their application within assistance systems, such as operating applications while driving. However, the actual value depends on the quality of the executed actions.⁵⁵

The following **three points** characterise LAMs.⁵⁶

- **Generalisability:** LAMs necessitate initial human demonstrations for each routine to be learned (one-shot learning). Over time, it is hoped that LAMs will develop a conceptual blueprint allowing them to be used with any application. The routines executed by LAMs are directly observable within the application. For instance, during a hotel booking, users can observe the inputs being entered into fields and buttons being clicked by the LAM, enhancing transparency and understanding.
- **Traceability:** The routine executed by the LAM is visibly performed directly within the application. For instance, in the hotel booking example, one can observe what period and location are entered into the input fields and which buttons are clicked. This provides transparency into what the LAM has learned and is currently doing.
- **Reliability:** As with all data-driven models, LAMs may produce incorrect outputs or actions (referred to as hallucinations in the context of generative AI). Given that actions are executed directly by LAMs without human oversight, these models are initially suitable only for non-critical applications.

These advancements represent a significant step toward **a future work environment** where the interaction between humans and machines becomes even more seamless and intuitive. The capability of LAMs to operate directly

54 See www.iese.fraunhofer.de/blog/large-action-models-nutzen-neurosymbolische-ki/ (last accessed on 3 September 2024).

55 *Ibid.*

56 *Ibid.*

with user interfaces without the need for API integration will open up new opportunities for **automation** and has the potential to fundamentally alter the way we utilise technology. If LAMs are transferred to humanoid robots that can carry out their instructions or independently anticipate their tasks, this will represent a significant **advancement in robotics**, with the potential to **revolutionise the workplace**.

II. Impact of generative AI on specific professions

During digitalisation, **routine tasks** will be the **first to be eliminated**. Routine tasks typically involve repetitive and predictable activities that can be standardised and systematised.⁵⁷ AI systems, especially those launched since ChatGPT, are becoming more complete and self-sufficient, so it is to be expected that the help they still need from humans to perform semi-automated tasks will become unnecessary in the future. These jobs are generally low-paid, do not need extensive training, and will disappear in some decades (eg, truck drivers, call-centre operators and clerks). With the advent of digitalisation and AI, technologies like robotic process automation (RPA) and machine learning algorithms can efficiently perform such tasks, reducing the need for human intervention. Examples of routine tasks that can be automated include data entry, document processing, inventory management and basic customer service.⁵⁸

However, it is **impossible to conclude** from the **decline** in the number of employees **in individual sectors** (eg, production or logistics) that there will be an **overall wave of unemployment** (see more on this topic below under 3. *Decoupling automation potential from expected job losses*). Automation and technological progress lead to lower labour costs in some sectors, resulting in lower prices for the final product. As a result, for example, new jobs could be created in aftersales or other sectors.⁵⁹

1. AI exposure and complementarity

To assess the impact of technological innovation on jobs, a commonly used approach conceptualises occupations as bundles of tasks and examines which tasks can be replaced or complemented by technology. The concept of '**exposure**' to AI can be used, which measures the degree of overlap between AI applications and the **previously** required human skills in each occupation. It refers to the possibility of **AI as a labour-displacing technology**.

57 See www.bcg.com/publications/2021/impact-of-new-technologies-on-jobs#demand-for-skills (last accessed on 3 September 2024).

58 See n 39 above.

59 See www.epi.org/publication/the-zombie-robot-argument-lurches-on-there-is-no-evidence-that-automation-leads-to-joblessness-or-inequality/ (last accessed on 3 September 2024).

This method also uses an index of potential AI '**complementarity**' that considers the social, ethical and physical context of occupations as well as the skill level required. The index reflects the degree to which an occupation is more likely to be complemented by AI. Complementarity is a game changer: while previous studies only looked at the potential for tools to be labour-displacing technology (LDT), this approach also covers the possibility that AI tools can assist workers. For example, AI is more likely to take on a **supportive role** in highly complex fields with a lower proportion of routine tasks. In addition, the tasks of a judge, who is highly exposed to AI due to advanced text analysis, will not be delegated to an unsupervised AI for **social/ethical reasons**. As a result, AI is likely to **complement judges** and increase their productivity **rather than replace them**.⁶⁰

Considering exposure and complementarity together sheds light on the likely labour market developments that each occupation may experience with AI adoption. Occupations with **high exposure and high complementarity** have significant potential for AI support, as AI can complement workers' tasks and decision-making. Conversely, occupations with **high exposure but low complementarity** are at greater risk of AI replacing human tasks, potentially leading to a decline in labour demand and slower wage growth.⁶¹

Occupations are thus divided into **three groups**: '**high exposure, high complementarity**', '**high exposure, low complementarity**', and '**low exposure**'. Occupations characterised by high exposure and high complementarity have significant potential for AI integration. In these roles, AI can effectively complement workers by assisting with tasks and decision-making. However, the nature of these primarily cognitive jobs, which involve high levels of responsibility and interpersonal interaction, limits the unsupervised use of AI. Professions such as **surgeons, lawyers and software engineers** exemplify this category, where workers can benefit from increased productivity through AI assistance, provided they have the necessary skills to interact effectively with the technology. Conversely, occupations with high exposure but low complementarity are poised for AI integration but face a higher risk of AI replacing human tasks. This scenario could lead to reduced labour demand and slower wage growth for occupations such as **telemarketers**. Finally, low-exposure occupations have minimal to no potential for AI application and include a wide range of occupations from **artisans, farmers and performers**.⁶²

The **winners of AI automation** can be identified as those who have a high level of AI exposure in conjunction with a high degree of complementarity. Conversely, those who are adversely affected by AI automation are those who have a high level of AI exposure in combination with a low degree of complementarity.

60 Download at www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379 (last accessed on 3 September 2024).

61 *Ibid.*

62 *Ibid.*

Within a country, **different groups** are likely to be affected differently by AI, which can exacerbate inequalities in areas such as income, education and gender. Understanding which groups are most vulnerable is critical to developing effective policies to mitigate these impacts. Interestingly, while the overall exposure to AI varies widely between advanced and emerging economies, the exposure patterns of individuals within countries are similar.⁶³

Most affected are white-collar jobs – ie, people working in offices – because many time-consuming tasks such as summarising texts, writing minutes or programming software will be at least partially performed by machines in the future. Therefore, programming activities, administrative office tasks and legal activities are among the areas most affected by generative AI. The biggest upheaval will be in administrative office work. In Germany, for example, up to 54 per cent of expected job changes are in this area. This is followed by customer service and sales at 17 per cent and production at 16 per cent.⁶⁴

Exposure to AI tends to be higher for **women and more educated workers**, but this is mitigated by a higher potential for complementarity with AI. Women are often employed in occupations with high exposure, which presents both risks and opportunities. Higher levels of education are associated with higher exposure, especially in occupations with high complementarity, suggesting that highly skilled workers may be more affected by AI. This strengthens the hypothesis that AI, unlike automation, is more likely to affect highly skilled workers. **Age differences** do not show a consistent pattern, mainly due to the different composition of age cohorts in terms of gender and education.⁶⁵

While exposure to AI is **spread across the income distribution**, the potential gains from AI are positively correlated with income. Occupations at risk of displacement are broadly similar across income percentiles, suggesting a difference from automation, where middle-income earners were more at risk. However, occupations with high complementarity to AI are more concentrated in the **upper-income percentiles**, suggesting that the benefits of AI may accrue disproportionately to higher earners. This uneven impact of AI on the income distribution is more pronounced in emerging economies, where complementarity increases significantly at the top of the income distribution. Overall, the benefits of AI tend to accrue to higher earners, although the extent of this phenomenon varies between countries depending on their economic structure and education system.⁶⁶

63 See n 60 above.

64 See www.mckinsey.com/mgi/our-research/a-new-future-of-work-the-race-to-deploy-ai-and-raise-skills-in-europe-and-beyond (last accessed on 3 September 2024).

65 See n 60 above.

66 *Ibid.*

2. *Automation and job demand trends*

By 2030, the use of generative AI will significantly impact automation potential and job demand across various industries. Here are the projected values for automation potential with and without generative AI, as well as the expected changes in job demand in each sector. The percentages refer to the total working hours in each industry.⁶⁷

- **Education/training:**
 - Automation potential without generative AI: six per cent
 - Automation potential with generative AI: 21 per cent
 - Job demand increase: 1.6 per cent
- **STEM experts (science, technology, engineering, mathematics):**
 - Automation potential without generative AI: 13 per cent
 - Automation potential with generative AI: 27 per cent
 - Job demand increase: 16.7 per cent
- **Management/legal:**
 - Automation potential without generative AI: 13 per cent
 - Automation potential with generative AI: 26 per cent
 - Job demand increase: 6.9 per cent
- **Creative/art management:**
 - Automation potential without generative AI: nine per cent
 - Automation potential with generative AI: 22 per cent
 - Job demand increase: 8.6 per cent
- **Office tasks:**
 - Automation potential without generative AI: 29 per cent
 - Automation potential with generative AI: 39 per cent
 - Job demand decrease: -18.3 per cent

⁶⁷ See n 64 above.

- **Community services:**
 - Automation potential without generative AI: 18 per cent
 - Automation potential with generative AI: 26 per cent
 - Job demand increase: 3.5 per cent
- **Building maintenance:**
 - Automation potential without generative AI: 13 per cent
 - Automation potential with generative AI: 20 per cent
 - Job demand increase: 5.3 per cent
- **Construction:**
 - Automation potential without generative AI: 24 per cent
 - Automation potential with generative AI: 30 per cent
 - Job demand increase: 6.9 per cent
- **Customer service/sales:**
 - Automation potential without generative AI: 21 per cent
 - Automation potential with generative AI: 26 per cent
 - Job demand decrease: -12.1 per cent
- **Healthcare:**
 - Automation potential without generative AI: 11 per cent
 - Automation potential with generative AI: 16 per cent
 - Job demand increase: 25.2 per cent
- **Transport services:**
 - Automation potential without generative AI: 19 per cent
 - Automation potential with generative AI: 24 per cent
 - Job demand increase: 7.9 per cent

- **Production:**
 - Automation potential without generative AI: 31 per cent
 - Automation potential with generative AI: 36 per cent
 - Job demand decrease: -5.3 per cent

3. *Decoupling automation potential from expected job losses*

The potential for automation cannot be equated with actual expected job losses or employment effects. The main reasons for this are **technological diffusion**, **employee flexibility** and **compensation mechanisms**.⁶⁸

A) TECHNOLOGICAL DIFFUSION

Technological diffusion refers to the gap between the **potential of a technology** and its **practical implementation**. The current trend is that although AI systems are rapidly advancing and already surpassing humans in select tasks, productivity is not increasing, but in fact falling.⁶⁹ There are various explanations, but the prevailing argument is that significant **delays in AI adoption** are the primary reason for this paradox. Currently, the adoption of AI lags significantly behind its technological capabilities.⁷⁰ The slow diffusion of AI is due to its status as a **general-purpose technology (GPT)**. GPTs, which are prevalent in many sectors, evolve over time and enhance the ability to invent new products and processes. Their widespread integration into the wider economy often takes a long time. For example, it took 25 years for computers to reach their long-term plateau of five per cent of non-residential investment. Similarly, about half of US manufacturing plants remained without electrification 30 years after the introduction of the polyphase system. These GPTs experienced **widespread productivity improvements** and adoption only after **significant complementary innovation** and investment.⁷¹ The slow speed of diffusion is also evident for the latest technological advances.⁷²

There are several reasons why the rate of adoption may be lower than expected. First and foremost, **automation technologies are only adopted** when they can perform a specific task at a **lower cost than a human worker**.⁷³ What is relevant to the labour market is not what

68 See <https://docs.isa.org/dp12428.pdf> (last accessed on 6 December 2023).

69 *Ibid.*

70 *Ibid.*; see www.nber.org/system/files/working_papers/w24001/w24001.pdf (last accessed on 3 September 2024).

71 See www.nber.org/system/files/working_papers/w24001/w24001.pdf (last accessed on 3 September 2024).

72 See n 68 above.

73 See n 68 above.

can theoretically be automated, but how much of these technological capabilities are actually profitable to adopt.⁷⁴ Thus, the pace of diffusion depends on labour costs, which are influenced by wage-setting factors such as minimum wage policies and the influence of collective bargaining. Labour costs at the lower end of the wage spectrum could provide some protection for workers from being replaced by machines. However, higher labour costs for workers in the middle of the wage spectrum could make automation more financially attractive if the ROI is reasonable.⁷⁵ The costs associated with implementing new technologies extend beyond the initial purchase. Additional investments are often required to maximise the potential and profitability of these technologies. This is especially true for significant innovations such as GPTs. Complementary investments may include significant organisational restructuring or acquiring the necessary skills through training and hiring.⁷⁶ Furthermore, early adopters may pay a higher price for the investment than those who buy a commodity. Experts believe that LLMs become commoditised over time as there are so many, some of which are open source, such as Llama 3.

In addition to economic factors, **ethical or legal barriers** may impede or limit the pace of technology adoption. A prominent example relates to **autonomous cars**, which present new legal challenges, particularly with respect to liability in the event of an accident. In addition, **ethical dilemmas** arise when an autonomous car is faced with situations in which it cannot prevent an accident. While some of these obstacles may eventually be resolved, they are undeniably impeding the rapid adoption of the technologies.⁷⁷ A final factor to consider is that society may strongly prefer that certain tasks and services **be performed by humans rather than machines**. For example, fields such as nursing or elder care may continue to rely on human labour, even as service robots gradually augment these professions in the future. As a result, certain human services are likely to retain a higher value than those provided by robots. This implies a **societal appreciation for human involvement** in certain tasks, preserving their comparative advantage.⁷⁸

B) EMPLOYEE FLEXIBILITY

A job often consists of a **combination of tasks**, not all of which can be automated. Even if some of the tasks within a job can be automated, that does not mean the whole job has to be automated. Workers in seemingly automatable occupations often **specialise** in non-automatable

74 See <https://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.20160696> (last accessed on 3 September 2024).

75 See n 68 above.

76 See n 71 above.

77 See n 68 above.

78 See n 68 above.

niches within their field.⁷⁹ Therefore, the initial impact of new production technologies on employment depends heavily on the **adaptability** of workers to changing demands. Typically, these technologies replace some tasks while complementing others. The extent to which automation technologies displace workers in certain roles depends on their ability to transition from tasks that can be replaced by machines to tasks that complement automation. Numerous studies indicate the effectiveness of this adjustment mechanism. Despite a decline in jobs that primarily involve routine and automatable tasks, the reduction of such tasks in the economy occurs largely through **task reconfiguration within occupations**.⁸⁰ For example, **automated teller machines (ATMs)** have directly replaced tasks previously performed by bank tellers. Surprisingly, despite the proliferation of ATMs, the number of bank tellers increased rather than decreased. While ATMs took over some tasks, tellers became more valuable in their remaining roles, such as serving small business customers.⁸¹ The trend toward **computerisation** has led to a substantial reduction in routine tasks.⁸² One study showed that between 1979 and 1999, less than one per cent of the decline in cognitive routine tasks in Germany was due to a decline in the share of occupations that relied heavily on cognitive routine tasks. Instead, most of the decline occurred within occupations as workers in routine-intensive cognitive occupations shifted from cognitive routine tasks to other tasks. Overall, the majority of task transitions occur within occupations rather than between occupations.⁸³ However, research suggests that individuals who were forced to change occupations during technological transitions experienced negative labour market effects, in contrast to those who remained in their original occupations. This suggests that individuals who adapted within their occupations likely developed the skills necessary to mitigate the potential adverse consequences of technological change.⁸⁴ In addition, studies have shown that workers in **routine occupations**, when exposed to computerisation, experienced a **14–16 per cent wage increase** over a decade upon transitioning to higher-paying cognitive roles, compared to those who remained in their original roles. These outcomes may be even more prevalent among individuals with higher skills and abilities. Thus, the fate of workers during periods of technological upheaval appears to depend on their **ability to acquire essential skills** in their new work environments or to advance within their occupations.⁸⁵

79 See www.sciencedirect.com/science/article/abs/pii/S0165176517302811 (last accessed on 3 September 2024).

80 See n 68 above; www.researchgate.net/publication/5034005_The_Skill_Content_Of_Recent_Technological_Change_An_Empirical_Exploration (last accessed on 3 September 2024); www.researchgate.net/publication/228731694_Technical_change_job_tasks_and_rising_educational_demands_Looking_outside_the_wage_structure (last accessed on 3 September 2024).

81 See n 68 above.

82 See n 68 above.

83 See www.researchgate.net/publication/228731694_Technical_change_job_tasks_and_rising_educational_demands_Looking_outside_the_wage_structure (last accessed on 3 September 2024); see n 68 above.

84 See n 68 above.

85 *Ibid.*

In general, new technologies are not expected to fully automate jobs or occupations on a large scale, but rather to change jobs and tasks within specific occupations. If workers can adapt to these changing task requirements, there may be **little displacement** of workers by machines. However, as the tasks that machines complement become more complex and challenging, employment opportunities for workers lacking certain skills will decline.⁸⁶

C) COMPENSATION MECHANISMS

However, the introduction of automation technologies will, to some extent, replace workers who previously performed tasks that are now automated. Whether this leads to an overall increase or decrease in employment remains ambiguous, as various compensating mechanisms counteract the initial displacement effect.⁸⁷ Specifically, automation triggers the following effects:⁸⁸

- **Productivity effect:** Technological innovations increase the productivity of companies, leading to cost reductions and subsequently lower prices, thereby increasing demand and output. In addition, automation may raise quality standards or facilitate the creation of novel products or services, thereby stimulating increases in demand and output. This expansion also spreads through the economy, increasing labour demand in all sectors, not just those integrating new technologies, through a multiplier effect; and
- **Reinstatement effect:** This effect occurs because of the complementarity between the new tasks and technologies or the increased availability of labour resulting from the displacement effect. The need for more workers to perform these new tasks increases the demand for labour.

The **net effect** of automation on employment remains an empirical question. Studies examining the employment effects of automation technologies span several levels, including company, industry and regional analyses. **Company-level studies** focus specifically on how the adoption of automation technologies affects employment within the investing companies.⁸⁹ In companies that adopt new technologies, there is **no decline in routine occupations**, despite the expectation that computerisation might eliminate such tasks. Instead, most of the decline in routine occupations is associated with a **decline in the percentage of companies** with larger shares of routine occupations.⁹⁰ In a similar vein, recent investigations suggest that the

86 *Ibid.*

87 *Ibid.*

88 See n 74 above.

89 See n 68 above.

90 See www.sciencedirect.com/science/article/abs/pii/S0927537119300090 (last accessed on 3 September 2024).

technology investments made by companies did not result in a net decrease in their workforce. This is attributed to the growth induced by technology, which offset any displacement effects experienced by these companies.⁹¹ Although company-level studies provide insights into internal processes within companies, they lack information about the adjustments that occur between companies. When companies automate, they may improve their competitiveness and potentially outperform non-automating companies. As a result, company-level findings may not translate directly into aggregate employment effects, as potential employment gains in automating companies may be offset by job losses in competing companies.⁹²

Sectoral studies examine the movement of workers between less and more innovative companies. For example, a recent study of 17 Organisation for Economic Cooperation and Development (OECD) countries found that the increased use of robots between 1993 and 2007 increased labour productivity and value added at the sectoral level by about 0.36 and 0.37 percentage points respectively, as measured by the productivity effect. However, the study did not find a significant impact on total hours worked, although it did find a negative impact on low-skilled workers. Similarly to company-level studies, sector-level studies provide suggestive insights into aggregate negative employment effects, often overlooking technology-driven shifts between innovative and non-innovative sectors.⁹³

Other studies have used **smaller regions as economies** to examine the broader effects of technological progress. One study found that the introduction of **robots** had a neutral net effect on local labour markets in Germany between 1994 and 2014. Although there was a loss of about 2.12 manufacturing jobs per additional robot, this was offset by an increase in service sector employment, resulting in **no net loss of employment** in local markets heavily exposed to robots.⁹⁴ Conversely, several studies of local US labour markets from 1993 to 2007 found an overall negative impact of robots on employment. According to this research, each additional robot per 1,000 workers reduced the employment-to-population ratio by 0.2 percentage points, demonstrating **limited effects on the broader US labour market**.⁹⁵

Consequently, the **robust productivity** and **reinstatement effects** of robots seem capable of offsetting their displacement effects in **Germany**, although their impact appears somewhat less pronounced in the **US**. This divergence could be attributed to various factors. In Germany, **employment protection laws** are more stringent compared to the US,

91 See https://doku.iab.de/preise/Best-Poster_Award_2018.pdf (last accessed on 3 September 2024).

92 See n 68 above.

93 *Ibid.*

94 See <https://doku.iab.de/discussionpapers/2017/dp3017.pdf> (last accessed on 3 September 2024).

95 See www.nber.org/system/files/working_papers/w23285/w23285.pdf (last accessed on 3 September 2024).

resulting in higher costs for companies when laying off workers. This scenario strengthens the incentive for German companies to provide **training** for workers to assume new roles rather than resorting to **layoffs**. Moreover, Germany's robust **vocational education system** likely contributes to a workforce that is more skilled and adaptable in assuming new tasks compared to their counterparts in the US. Additionally, the **higher formal education levels** among German manufacturing workers exposed to robots imply potential higher rankings within the German wage structure compared to similar workers in the US. Consequently, the gains in productivity from robot automation might be more substantial in Germany than in the US, potentially leading to stronger compensatory mechanisms in Germany compared to the US.⁹⁶

A study on the effects of **computerisation** found that it had **significant displacement** effects, leading to a reduction in employment of 1.64 million jobs in the **EU** between 1999 and 2010. However, the induced **productivity effects of computerisation** generated a larger number of additional jobs, resulting in a net increase of 1.79 million jobs.⁹⁷ Other findings from a study in the **US** suggest that computerisation did not result in overall negative employment effects.⁹⁸

Recent evidence from phases of automation suggests that **computerisation** has not had a negative effect on employment in the US and has even had a positive effect in the EU. This illustrates that past automation technologies have displaced large numbers of workers but had either **no or minimal negative employment effects** due to substantial compensating mechanisms. Thus, focusing solely on the potential for automation does not fully explain how these technologies affect the labour market.⁹⁹

4. *Jobs in demand*

A) CARE SECTOR

AI might overtake humans in many tasks in the next decade. Globalisation, the interlinking of individuals and companies, and the increasing economic strength of some emerging markets can be seen as reasons for this. In addition, more people are being recruited for **non-routine support work**. But other factors – such as increasing life expectancies and the associated increase in people's need for nursing care – are ensuring that, despite

96 See n 68 above.

97 *Ibid.*

98 See www.ddorn.net/papers/Autor-Dorn-LowSkillServices-Polarisation.pdf (last accessed on 3 September 2024).

99 See n 68 above.

pioneering technical innovations in the medical sector and the establishment of intelligent nursing robots, **more jobs** are being created **in the care and health sector**.¹⁰⁰ In the US, demand for health professionals and aides has grown by 30 per cent.¹⁰¹

B) IT SECTOR

Three forms of jobs will be in demand due to advancing technologies: frontier work, last-mile work, and wealth work.¹⁰²

- **Frontier work** means producing, installing, maintaining and developing new technologies.
- **Last-mile work** involves carrying out nearly automated tasks that still need residual human components. These jobs generally receive low pay and do not require a high level of training.
- **Wealth work** means consumer luxuries (eg, personal coaches, dog groomers), which are on the rise due to increased incomes, especially in densely populated areas.

As already mentioned, there is also a **growing need for secure data transmission and automated data processing**. This results in many jobs for classic IT specialists in companies, regardless of the industry.¹⁰³ The same applies to marketing specialists and data analysts. At the same time, **many simple tasks cannot be automated so far** (eg, hairdressers, technicians or cleaning staff). Physical work will not disappear; it will continue to account for 31 per cent of working time in the US.¹⁰⁴ However, the **fastest growth in jobs until 2030** is to be expected for **high-skilled jobs related to technology**, such as AI and machine learning specialists.¹⁰⁵

5. *New types of jobs*

Technology adoption will create jobs in the **IT sector** in particular, but not exclusively; jobs that do not yet exist will be created in all sectors and will redefine the role of human workers.¹⁰⁶ Besides these 50 million jobs globally, in many areas, new jobs are not just about developing the technology itself. New jobs

100 See <https://onlinelibrary.wiley.com/doi/full/10.1111/1744-7941.12325> (last accessed on 3 September 2024).

101 See n 39 above.

102 Randstad, welcome to new work paradigms. Download at <https://amcham.pl/wp-content/uploads/2023/11/AQ-1-2021.pdf> (last accessed on 22 October 2024).

103 See n 5 above.

104 See n 39 above.

105 See n 5 above.

106 *Ibid.*

are emerging especially in connection with AI and big data (eg, development, maintenance, and upgrading of AI systems).¹⁰⁷ Technology is, however, necessary as an aid or **even as the reason for the new job**. A few examples are:

- **Cloud computing programmers:** The increasing volume of data must be stored securely somewhere, which is the task of cloud programmers;
- **Cyber security developers:** Large corporations and governments are hacked almost every day. New security systems for IP and image protection must be developed daily;
- **Online fitness consultants:** This type of job offers proactive, personalised courses with technological support to assist people with health issues, regardless of time or place. Increased data processing helps to detect chronic health conditions in advance. Such technology is also necessary to communicate and market the service via social media networks;
- **Human-machine coordinators/ethical sourcing managers:** The increased use of technical aids and increased public awareness are leading to more transparency, tighter internal controls, and an increase in public statements. Internally, an optimal working atmosphere between humans (cognition, judgment, empathy, versatility) and intelligent robots/algorithms (accuracy, endurance, calculation, speed) must be created based on ethical guidelines, and externally, a careful assessment must be made before communication takes place; and
- **AI-assisted medical technicians:** Digital aids and communication media allow patients to be examined, cared for, and monitored outside clinics.

III. By sector

Digitalisation in different sectors is characterised by its **disruptive approach**, under which existing business models are being completely supplanted.¹⁰⁸

The main reasons for disruption are:¹⁰⁹

- technological revolution;
- the war for talent;
- globalisation;

¹⁰⁷ *Ibid.*

¹⁰⁸ See www.bpb.de/shop/zeitschriften/apuz/225692/die-digitalisierung-der-dienstleistungsarbeit/ (last accessed on 3 September 2024).

¹⁰⁹ See www.grantthornton.global/en/insights/articles/business-services---five-forces-of-disruption/ (last accessed on 3 September 2024).

- new business models; and
- reputational risks.

Compared to the past, **innovation cycles are becoming shorter**, meaning that existing and new companies must constantly rethink and adapt their business model(s). The **average lifetime** of a **company** was 33 years in 1984: in 2016 it was no more than 24 years, and **in 2027** it is expected to be **only 16 years**.¹¹⁰ Only 48 per cent of the Fortune 500 companies from the year 2000 still exist today (with the same business model as at that time).¹¹¹

Digitalisation has no general focus on specific sectors or individual industries, however. **Digitalisation affects every sector equally**, but the impact on individual companies reveals itself at different speeds. The greater the competitive pressure, the more likely it is that a company will be left behind.

1. *Service and industry sector*

Sectors generally differ from each other in their approach: with disruptive business models in the **service sector**, new network platforms are emerging every day. Especially with **internet platforms**, the **'the winner takes it all'** principle applies. In the service sector, AI has a particular impact on customer interaction and generating creative content for marketing and sales.¹¹² In the banking/fintech sector, for example, we can expect AI to generate an additional US\$200–340bn in annual revenue through efficiencies when use cases are fully implemented.¹¹³

In the **manufacturing sector**, on the other hand, an incremental, ongoing process of automation characterised by regular job cuts to save costs has been taking place for decades. However, the speed of the digital changeover process varies. In Germany, for example, the chemical industry, automotive industry and agricultural sector are considered to be particularly advanced, while the textile industry still has cheap manual production in China, Bangladesh and Thailand, although the cutting, printing, and sewing could easily be done by production robots in the near future.¹¹⁴

Constant technical improvement and the development of new business models are taking place in both sectors, however. The **problem with existing companies** in both the blue-collar and white-collar sectors, compared to start-ups, is often that they simply continue their successful business plans from the past, try to maintain the status quo, and keep their existing business models alive for as long as possible. This is sometimes called **the winner's dilemma**. In large companies, moreover,

110 See www.innosight.com/insight/creative-destruction/ (last accessed on 3 September 2024).

111 See <https://ryanberman.com/the-dawn-of-the-business-apocalypse/> (last accessed on 22 October 2024).

112 See n 21 above.

113 *Ibid.*

114 See www.tagesschau.de/ausland/asien/bangladesch-rana-plaza-jahrestag-101.html (last accessed on 3 September 2024).

long decision-making processes and intensive discussions with stakeholders can lead to trends being overlooked until they have passed the company by and competitors have taken the lead. Approximately 90 per cent of all business model innovations are just new combinations of only 55 existing ideas, concepts and patterns.¹¹⁵

2. *Logistics and transportation sector*

Logistics is a key sector for every manufacturing industry and the one that will **change the most** in the coming years. Currently, millions of logistics jobs in the US are seriously jeopardised because **warehousing** is fully automated. Robots have started to take over picking and packing in warehouses. Trucking, warehousing and parcel delivery companies cut a combined 16,900 jobs in February 2023 alone.¹¹⁶

Autonomous vehicles will radically change the transport sector but are only an intermediate step toward fully automated logistics. The advantage of an autonomous system is that it can drive almost around the clock, while an employee in the US can sit behind the wheel for a maximum of 11 hours a day and a total of 60 hours a week.¹¹⁷ In addition, a well-functioning algorithm has lower failure rates, and the higher acquisition costs for the system are recovered after three to four years.¹¹⁸ For this reason, the development of **self-driving trucks** is gaining pace.¹¹⁹ Intelligent, self-driving trucks are still some years away, as the technology does not work properly on small country roads or in larger cities. Until then, truck drivers will be in great demand, but this is also one of the most unpopular jobs due to poor working conditions.¹²⁰

The transition to **self-driving cars** has also already begun in passenger transportation: San Francisco was the first city to approve driverless cabs. As a result of technological advancements, it is likely that these will become more affordable than owning a vehicle in the near future.¹²¹

However, automating jobs in the transportation/warehousing sector does not necessarily mean laying off employees: no other company automates its warehouses as much as Amazon. As soon as this automation process is complete, an employee is no longer needed at their old job. To avoid layoffs and due to

115 The St. Gallen Business Model Navigator, Download at <https://wackwork.de/wp-content/uploads/2017/11/St-Gallen-Business-Model-Innovation-Paper.pdf> (last accessed on 3 September 2024).

116 See www.wsj.com/articles/slowdown-in-e-commerce-hitting-logistics-companies-payrolls-experts-say-518c9fcd (last accessed on 3 September 2024).

117 See www.businessinsider.de/wirtschaft/lkw-firmen-locken-in-den-usa-mit-100-000-dollar-jahresgehalt-b/ (last accessed on 3 September 2024).

118 See www.theguardian.com/technology/2017/oct/10/american-trucker-automation-jobs (last accessed on 3 September 2024).

119 See www.chinadaily.com.cn/a/202301/04/WS63b4d91ca31057c47eba7957.html (last accessed on 3 September 2024).

120 See www.nytimes.com/2022/09/28/business/driverless-trucks-highways.html (last accessed on 3 September 2024).

121 *Ibid.*

constant growth, Amazon is spending US\$1.2bn to **retrain** about 300,000 **US employees** by 2025. Amazon began this retraining programme for all American employees (including finance, legal and IT) in 2019.¹²²

3. *Retail sector*

The **retail sector** is the sector with the highest employment rate in most countries and will change even more radically in the future than it has to date. In the US alone, 15.5 million employees work in this sector, which accounts for about 11.6 per cent of the working population.¹²³ In the UK, 34 per cent of retail jobs are affected by increasing digitalisation (**'retail meltdown'**).¹²⁴ Furthermore, smaller retailers have been disappearing and being integrated into large retail chains, which in turn can no longer compete with online shopping platforms and have to adapt their business models. Goods worth US\$9.8bn were ordered on Black Friday 2023 using a computer, tablet or smartphone alone, representing an increase of 7.5 per cent over 2022.¹²⁵

Retail sales are increasingly shifting from 'bricks and mortar' to e-commerce: while e-commerce only accounted for 7.4 per cent of total retail sales in 2015, it had risen to 19.5 per cent by 2023. The share rose by four per cent in 2020 alone because of lockdowns during the coronavirus pandemic. In the coming years, an increase of around one per cent per year is expected, meaning that e-commerce will account for almost a quarter of global retail sales in 2027.¹²⁶

While **2 million jobs** in the US retail sector **were eliminated** at the beginning of the Covid-19 pandemic, numbers are rising again.¹²⁷ It can be assumed that many employees are being **reallocated** to the **booming e-commerce sector**. Online platforms can usually offer their products cheaply only because the number of employees is radically reduced, and the goods are delivered directly to the customer from warehouses or external suppliers; this saves rental costs for stores and the associated labour costs, for example for sales personnel. Generative AI is expected to deliver value equal to an additional US\$400–660bn per year in retail and consumer products.¹²⁸

122 See www.aboutamazon.com/news/workplace/upskilling-2025 (last accessed on 3 September 2024).

123 See <https://fred.stlouisfed.org/series/USTRAD> (last accessed on 3 September 2024); www.statista.com/statistics/192361/unadjusted-monthly-number-of-full-time-employees-in-the-us/ (last accessed on 3 September 2024).

124 See www.pwc.com/hu/hu/kiadvanyok/assets/pdf/impact_of_automation_on_jobs.pdf (last accessed on 3 September 2024).

125 See 6 Trends That Shaped 2023's Black Friday - Cyber Monday Results (forbes.com) (last accessed on 3 September 2024).

126 See Global e-commerce share of retail sales 2027 | Statista (last accessed on 3 September 2024).

127 See n 123 above.

128 See n 21 above.

At the same time, digitalisation in stores makes **many jobs obsolete**. Amazon started to revolutionise food shopping by operating ‘AmazonGo’ stores without human workers.¹²⁹ An AI-based technology automatically detects when someone takes a product off the shelves, automatically charges the purchase to an Amazon account, and orders replenishment when the shelf becomes emptier. Replenishment deliveries are also largely automated: Amazon acquired the special robot manufacturer Kiva systems for intelligent warehouse management without human intervention in 2017 and already has more than 520,000 robotic drive units.¹³⁰ Despite these gloomy prospects, the job of retail salesperson is still one of the most frequently completed vocational training programmes in many countries, although the numbers are steadily decreasing (eg, by 28 per cent in Germany from 2010 to 2020).¹³¹ In the future, however, it will gradually be replaced by the occupation of ‘e-commerce retail salesperson’, training for which was offered for the first time in 2018 and has been in great demand since.¹³²

4. *Legal sector*

Lawyers’ chance of being replaced by intelligent machines is estimated to be between seven and eight per cent.¹³³ The main reasons for this **high job security** is that a trustworthy relationship with clients is still necessary, and creativity is still needed from human beings to solve new and high-end legal problems. Critical and analytical thinking will be the most needed soft skills in the future.¹³⁴ Nevertheless, in 2022, 85 per cent of lawyers expected that the trend toward increased use of technology will cause significant changes in the next three years.¹³⁵

Currently, the legal system and the business model of many law firms rely on armies of paralegals and researchers to gather, index and process information. For law firms at present, this can be expensive, driving up the rates they charge. **AI and big data analyses** can **speed up the process** of getting relevant information, review documents and contracts, and help perform due diligence.¹³⁶ For example, by using AI, legal departments can reduce the time spent on a

129 See www.handelsblatt.com/unternehmen/handel-konsumgueter/amazon-go-amazon-bringt-einkaufen-ohne-kassen-erstmal-auf-supermarkt-groesse/27290134.html (last accessed on 3 September 2024).

130 See www.bloomberg.com/news/articles/2018-09-19/amazon-is-said-to-plan-up-to-3-000-cashierless-stores-by-2021 (last accessed on 3 September 2024); www.aboutamazon.com/news/operations/10-years-of-amazon-robotics-how-robots-help-sort-packages-move-product-and-improve-safety (last accessed on 3 September 2024).

131 See www.handelsdaten.de/arbeitsmarkt/auszubildende-zum-kaufmann-frau-im-einzelhandel-deutschland-zeitreihe (last accessed on 3 September 2024).

132 See www.handelsdaten.de/arbeitsmarkt/auszubildende-e-commerce-deutschland-zeitreihe (last accessed on 3 September 2024).

133 See www.oecd.org/future-of-work/reports-and-data/what-happened-to-jobs-at-high-risk-of-automation-2021.pdf (last accessed on 3 September 2024).

134 See n 5 above, 38.

135 KI Paradigmenwechsel für die Rechtsabteilung? (Wolters Kluwer), Download at www.wolterskluwer.com/de-de/know/ai-game-changer-for-corporate-legal-departments#Form (last accessed on 3 September 2024).

136 See <https://bernardmarr.com/how-ai-and-machine-learning-are-transforming-law-firms-and-the-legal-sector/> (last accessed on 3 September 2024).

contract review from three hours to 45 minutes.¹³⁷ It is also possible for AI to forecast litigation outcomes, and find trends and patterns in past case law, win/loss rates and a judge's history.¹³⁸ AI-based prediction of trial outcomes will significantly increase settlements at an early stage of lawsuits, thereby avoiding costly and lengthy proceedings (especially in the US). This development will be enhanced by legal insurance companies. Research assistants and paralegals are therefore more at risk of being replaced.¹³⁹ However, as new laws are passed every day, the **intelligent systems** must be **regularly updated** and **frequently controlled** by lawyers.

Platform technology opens new ways of **fulfilling services** for law firms **even without** lawyers, especially in standardised processes such as claiming compensation for flight delays under European law or defending against these claims. These enhanced transparency services and free access to legal know-how on the web change the relationship between client and lawyer. Law firms must **adapt legal tech** because clients are not willing to pay high hourly fees anymore. Instead of hourly payment, law firms need to provide licences, pay-per-user-models, flat rates, no-win-no-fee offers, or a combination of a fixed basic remuneration and variable extra fees.¹⁴⁰ Although law firms are starting to cooperate with IT specialists more and more, the lawyers still have to create the content. Finally, even the best system cannot analyse every single contract clause designed by another human. It can check standardised clauses and can recognise patterns, but the **final check** of an **individual matter** still **must be performed by a lawyer**.

However, lawyers' day-to-day work is changing fundamentally: smart operations and legal tech can **increase efficiency**, leading to **a higher level of legal advice** and **more pressure on law firms' costs**. Experts even expect a boost in innovation in the legal tech blockchain, a database whose integrity is secured. In the future, this will create opportunities in legal practice to conclude automated contracts without the need for institutions to guarantee the authenticity of the parties involved, such as banks, land registry offices and notaries.¹⁴¹

5. *Banking sector*

Banks intend to **cut thousands of jobs** – mainly in back-office and customer service functions – in part due to **dematerialisation**.¹⁴² where people used to

137 See n 135 above.

138 See <https://emerj.com/ai-sector-overviews/ai-in-law-legal-practice-current-applications/> (last accessed on 3 September 2024).

139 See www.lto.de/recht/kanzleien-unternehmen/k/chatgpt-chatbots-kuenstliche-intelligenz-ersatz-anwaelte-richter-rechtswesen-anwaltschaft-ki/ (last accessed on 3 September 2024).

140 See www.juve.de/nachrichten/namenundnachrichten/2019/08/interview-zur-preisgestaltung-manche-anwaelte-verstehen-nicht-mal-die-basics (last accessed on 3 September 2024).

141 See www.haufe.de/thema/legal-tech/ (last accessed on 3 September 2024).

142 See www.theuxda.com/blog/banks-will-cut-millions-of-jobs-in-the-next-decade (last accessed on 3 September 2024).

receive their money at the counter from an employee, there is now an ATM in need of maintenance. But now ATMs are also being used less frequently due to the widespread use of online banking and payment by credit card. Already, **contactless payment** via smartphone is becoming the standard means of payment. In this case, no bank employee must deal with the customer's request, as it is automated, and the smartphone performs authentication. The 99 per cent accuracy of face recognition makes banking even more secure than with PIN or TAN procedures. Over 2.8 billion people used mobile payments in 2022.¹⁴³ More than half of them were in Asia. The Chinese apps Alipay and WeChat Pay had the most users worldwide, while Apple Pay is mostly used in the US.¹⁴⁴

6. *Creative jobs*

Technological advantages can also be used for basic communication. AI-powered chatbots and virtual assistants are increasingly being used to handle customer enquiries and provide basic support, reducing the need for human operators. These chatbots can understand natural language, provide automated responses, and even learn from interactions to improve their performance over time. Therefore, AI is also impacting jobs in areas such as customer support and telemarketing. Similarly, advancements in natural language processing and speech recognition technology enable AI systems to generate written content, such as news articles, financial reports and sports commentary, with minimal human involvement. While these systems may not completely replace human writers or customer service representatives, they can streamline operations and reduce the overall number of required human resources.

Research suggests that generative AI also has the potential to automate 26 per cent of creative jobs. These jobs involve tasks that require originality, imagination and subjective decision-making, such as graphic design, advertising and content creation. While AI cannot replicate human creativity and intuition entirely, it is increasingly being used to support creative processes and generate content. For instance, AI algorithms can analyse vast amounts of data to identify patterns and preferences, enabling marketers to personalise advertisements and target specific audiences more effectively. AI can also generate basic designs or recommend creative elements based on user preferences and historical data. In the music industry, for example, more and more songs are being released that were generated by AI based on songs by well-known artists. Universal Music Group therefore called on major music streaming services to take action. Photo databases are also increasingly expanding their inventories with AI-generated images.

The threat to creative jobs is also evident in the strikes by screenwriters in Hollywood that started in May 2023. Among other things, they went on strike out of fear that future language models would write scripts instead

143 See [Mobiles Bezahlen mit digitalen Geldbörsen - Statistiken & Fakten | Statista](#) (last accessed on 3 September 2024).

144 See www.businessofapps.com/data/mobile-payments-app-market/ (last accessed on 3 September 2024).

of them. In September 2023, they finally took a major step toward a resolution when the Writers Guild of America reached a tentative deal on a new contract with the entertainment companies. Among other things, the writers won concessions on guidelines for the use of AI. It is now prohibited for AI to write or rewrite literary material, for AI-generated material to be considered source material, and for companies to use AI software without the supervision of a writer. Also, writers must be informed if they are given materials that have been generated by AI.

In summary, digitalisation and AI can eliminate or transform routine tasks by automating repetitive activities, reduce the demand for certain communication-based jobs using chatbots and virtual assistants, and augment creative jobs by assisting in content generation and decision-making. While some jobs may be eliminated, new roles and opportunities are also emerging as organisations adapt to the changing technological landscape.

IV. Changes and necessary skills on the future labour market

The labour market of the future will be characterised not only by **technical changes**, but also by **social and environmental changes** and **changes in workers' mentality**.

1. *Wage/salary polarisation*

As a result of the digitalisation and automation of the labour market and demographic changes, **wages are increasingly becoming polarised**.¹⁴⁵ This means that as demand for work requiring lower or higher qualifications is increasing compared to work requiring medium qualifications, wages at the extremes of the wage distribution will rise, while wages in the middle range will fall or jobs will be eliminated due to digitalisation.¹⁴⁶

One reason for the polarisation is that occupations with salaries in the middle range often involve **routine tasks** that can therefore be **automated more easily**. This puts these occupations at high exposure, while there is also little need for AI as an assistant (low complementarity). Managers with higher qualifications, on the other hand, often have a broad range of tasks. Another reason is that the occupations with **wages in the middle range** are the **most profitable to automate**.

In addition, the added **value generated by using AI** primarily **benefits highly skilled occupations** with high complementarity, regardless of exposure, causing their salaries to continue to rise. This also increases the polarisation of wages.¹⁴⁷

145 See <https://doi.org/10.3982/ECTA19815> (last accessed on 3 September 2024).

146 See <https://economics.mit.edu/sites/default/files/2022-09/Automationpercent20andpercent20Polarisation.pdf> (last accessed on 3 September 2024).

147 See https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3368605 (last accessed on 3 September 2024).

2. *Different employability*

Artificial intelligence also changes the way in which employees do their job. **Different generations of employees** are growing up with different prerequisites. Some generations are brought up completely with technology, while others grow up in poverty and completely without technology. This is also reflected in their attitudes towards technology. Many elderly workers are wary of new technologies. Therefore, **workforce retraining** is a growing concern in all countries.

Many **young and digital workers** have grown up with 'technology', feel comfortable on social media, and thus have a **decisive advantage** over older generations. This applies particularly to '**Generation Z**', which, according to its prevailing image, is fascinated by technology (or even addicted to it) and already follows the rapid pace of change in digital business models.¹⁴⁸ Generation Z is considered to be forward-looking and productive. This generation is also said to have a weaker sense of loyalty to an employer. Generation Z has a **different understanding of leadership and responsibility**; it has less interest in companies, governments and authorities, and instead thinks in project-oriented terms.¹⁴⁹ Future employees of this generation are more independent and do not think much of traditional hierarchical corporate structures.

Young workers demand **more flexibility**. Thus, the demand for jobs that allow remote work or flexible working hours is increasing. Companies are adapting to these demands to attract and retain talent. There is also a shift in mentality among younger generations toward a **fairer work-life balance**. This can lead to demand for jobs that respect personal time, offer comprehensive benefits, and allow for time off and sabbaticals. Employers therefore need to create workplaces that prioritise their people.

There is also a big **difference in employability** based on the type of job and the level of education. Workers in low-paid jobs are up to 14 times more likely to face the need to change jobs, and workers with no tertiary education are 1.7 times more likely to face displacement and the need to change jobs than those with a bachelor's degree or higher.¹⁵⁰

3. *Digital transformation amid demographic shifts: opportunities and challenges*

For the foreseeable future, **demographic shifts** will increasingly **hamper digitalisation**. Taking Germany as an example, there has been a steep increase in the shortage of skilled professionals for digital roles since the beginning of 2021

148 See www.oxfordeconomics.com/resource/gen-z-role-in-shaping-the-digital-economy/ (last accessed on 3 September 2024).

149 See www.lecturio.de/magazin/generation-z/ (last accessed on 3 September 2024).

150 See n 39 above.

and no immediate signs of improvement. The projected annual inflow of STEM professionals is expected to cover only half of the replacement needs over the next five years. The existing **shortage of professionals** in specific sectors is gradually developing into a **widespread shortage**. This projection is underscored by the significantly smaller size of the 15–24-year-old cohort in Germany in 2020 – nearly 500,000 fewer individuals compared to today's 55–64-year-olds, who are expected to retire and leave the labour market over the next decade.¹⁵¹

The looming labour shortage is a major challenge for companies. However, there is also room for optimism that **ongoing digitalisation**, even when combined with rationalisation effects, **will not lead to persistent unemployment**. The likelihood of finding a new job after a job loss tends to increase as a result of demographic change, provided that labour market policies facilitate rather than hinder job mobility. Another mitigating factor is that skills shortages slow down the pace of change, meaning that most workers will perceive digitalisation not as a disruptive event but as an **evolutionary process of adaptation**.¹⁵² In addition, digitalisation is increasingly enabling remote working, thereby expanding the scope for addressing the looming labour shortage. First, it is conceivable that part-time workers with family caregiving responsibilities could **extend their weekly work hours by using remote work**, since the regular commute is at least partially eliminated. Second, companies may be able to **broaden the applicant pool** to include individuals who live further away from their future jobs.¹⁵³

Given the challenges posed by the skills shortage, the **average time to fill a vacant skilled position** in Germany is currently **more than 165 days** (March 2023 to February 2024),¹⁵⁴ an all-time high. It is no surprise that the vast majority of companies continue to report difficulty filling open positions. The escalating competition among companies for a dwindling labour pool is having a growing effect. First, it is expected to **drive up wages and labour costs for companies**. This adds to the **urgency of harnessing the productivity potential of new technologies** to maintain price competitiveness. Second, the **dynamics of labour mobility** are likely to accelerate, as workers have more options in the labour market and companies are more focused on recruiting talent from each other. As a result, it will become increasingly important for companies to present themselves as attractive employers, both to attract new employees and to retain existing ones.¹⁵⁵

151 Stettes, 'Wenn digitaler auf demografischen Wandel trifft – Welche Chancen und Risiken birgt die digitale Transformation bei einer schrumpfenden und alternden Erwerbsbevölkerung?' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 31. Download at www.iwkoeln.de/studien/annette-dietz-andrea-hammermann-oliver-stettes-betriebe-im-transformationsprozess.html (last accessed on 3 September 2024).

152 *Ibid.*

153 *Ibid.*

154 See <https://de.statista.com/statistik/daten/studie/1318407/umfrage/vakanzeit-gemeldeter-arbeitsstellen-nach-anforderungsniveau/> (last accessed on 3 September 2024).

155 See n 151 above.

Companies will find it difficult to recruit new talent with the skills needed for transformation. As a result, they will rely more on **implementing digital transformation with the existing workforce**. This presents challenges. While older workers are not inherently less willing and able to learn, the **differences between older workers are more pronounced due to different career trajectories**. In addition, such transformative processes can challenge the status of long-tenured employees, potentially leading to conflict.¹⁵⁶

Whether companies can successfully navigate demographic change and complete digitalisation significantly hinges on their ability to garner acceptance for changes among employees and empower them to tackle upcoming challenges. This acceptance is encouraged particularly when organisational leaders transparently communicate the need for change and the planned strategies, fostering employees' openness to change and the adaptability of the company. Successfully navigating change also involves considering employees' needs, providing them with opportunities to actively participate in shaping the transformation, investing in continuous education, and fostering a culture that embraces learning from mistakes. These factors significantly contribute to effectively managing the transition.¹⁵⁷ Demographic shifts and digitisation make continuous assessment of age demographics and current and future skill profiles an ongoing necessity. Where this is achieved, potential need for action can be identified at an early stage and appropriate measures can be initiated. A concrete example is early engagement with older employees, asking them whether and under what conditions they see themselves continuing to work beyond retirement age. This is particularly relevant for companies that perceive a high risk of not being able to recruit suitable young talent.¹⁵⁸

4. *Necessary skill set for workers in the future*

Irrespective of the industry, **companies need highly qualified and well-trained employees more than ever** because AI is not just changing jobs; it is enhancing them. In this context, 81 per cent of companies will have to make lifelong learning and on-the-job training a key strategy to achieve their business goal.¹⁵⁹ The stronger **focus on education and qualifications** – not only at the front end – as well as the importance of technological development is therefore only logical. **Soft skills**, such as innovative thinking, team spirit, openness to criticism, assertiveness, creativity, critical thinking, social and communicative skills, good time management, and a basic understanding of digital technologies are more important than professional knowledge.¹⁶⁰ Verbal and grammatical accuracy, as

156 *Ibid.*

157 *Ibid.*

158 *Ibid.*

159 See n 5 above, 57.

160 See www.bcg.com/de-de/publications/2017/people-organisation-technology-how-gain-develop-digital-talent-skills.aspx (last accessed on 3 September 2024).

well as spatial imagination and a good memory, are no longer so important due to the use of digital tools. The same applies to traditional skills such as physical endurance, precision and dexterity.¹⁶¹ The ability to use IT tools will be one of the basic requirements for every employee in the future.¹⁶²

The European Commission is set to run a pilot project for the European Digital Skills Certificate, which will serve the purpose of motivating students and young professionals to acquire and demonstrate digital skills.¹⁶³ However, it is not only students who should be looking into such measures. A study shows that 77 per cent of employees must learn new skills or completely retrain to remain employable, and 64 per cent of all workers think that AI presents more opportunities than risks.¹⁶⁴

According to a survey of 2,000 C-level executives, the skills with the highest demand over the next five years include:

- digital skills (46 per cent);
- specific IT skills such as AI and generative AI (45 per cent);
- data skills (42 per cent);
- creativity and innovation (40 per cent);
- critical thinking (37 per cent);
- leadership (37 per cent);
- large-scale abilities (27 per cent); and
- emotional intelligence (26 per cent).

This survey emphasises the growing importance of both technical and soft skills in the future job market.

5. *Necessary skill set for managers in the future*

Traditional specialist knowledge is therefore **not so important** for preparing future generations for their tasks. Complex problem-solving, critical and logical thinking, creativity and flexibility, working on multi-faceted tasks, people management, teamwork, building networks, and a fundamental grasp of analytical

161 See n 5 above.

162 See www.mckinsey.com/capabilities/mckinsey-digital/our-insights/digital-transformations-the-five-talent-factors-that-matter-most (last accessed on 3 September 2024).

163 See https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2246 (last accessed on 3 September 2024).

164 See www.pwc.com/gx/en/issues/upskilling/hopes-and-fears.html (last accessed on 3 September 2024).

and technical matters are more important.¹⁶⁵ Retraining is more important than ever, and besides the technical skills,¹⁶⁶ social skills will always remain crucial. Finding the right combination of 'Tech&Touch' will be vital for the future of work.¹⁶⁷

The line manager of the future should be an expert who **leaves room for individual development** and **moderates rather than controls**. The removal of working time limits, **a more independent way of work** not just for managers, will define the future of work. Managers should assign tasks or projects to their employees and should see them as quasi-freelancers in the company. More project work, a broader know-how basis thanks to the connectivity of people, and more technical aids will allow for **less daily personal contact and control**. AI enables workers to save time in their day-to-day work.

For managers, the focus is on '**connected leadership**', meaning organisational performance in several dimensions of leadership. If the aim is to increase productivity, it is important to **recognise correlations, employee motivation**, and the **formation of networks** of knowledge, information, space and social capital; this is more important than drilling procedures and specifying rigid criteria.¹⁶⁸ Because of employees' expected decreased loyalty to employers and a declining acceptance of hierarchies, managers need to appeal to especially highly skilled employees with **interesting and varying projects** and a **strong personality**.

6. *Four key priorities for managers in the AI era*

The adoption of automation technologies will be crucial for maintaining businesses' competitive advantage in an era dominated by automation and AI. To ensure successful implementation at the company level, business leaders can focus on four key priorities.¹⁶⁹

- **Understand the potential:** Leaders need to grasp the potential of these technologies, particularly how AI and generative AI can augment and automate work. This involves estimating the total capacity these technologies could free up and their impact on job roles and skill requirements. This understanding allows business leaders to frame their comprehensive strategy and set adoption goals for these technologies.
- **Plan a strategic workforce shift:** Once the potential of automation technologies is understood, leaders must plan the company's transition toward readiness for the automation and AI era. This requires assessing

165 Download at <https://publications.jrc.ec.europa.eu/repository/handle/JRC117505> p 29 (last accessed on 22 October 2024).

166 See n 162 above.

167 See www.randstad.de/ueber-randstad/randstad-deutschland/unternehmensstrategie/9 (last accessed on 3 September 2024).

168 See www.cec-managers.org/wp-content/uploads/2017/07/CEC-Leadership-Report.pdf (last accessed on 3 September 2024).

169 See n 64 above.

the workforce and skill needs based on strategically identified use cases to evaluate the potential future talent gap. This analysis will identify the required extent of recruiting new talent, upskilling, or reskilling the current workforce, and reallocating freed capacity to more value-added tasks.

- **Prioritise people development:** To ensure the right talent is available to support the company strategy throughout all transformation phases, leaders should enhance their capabilities to identify, attract, and recruit future AI and generative AI leaders in a competitive market. Additionally, accelerating the development of AI and generative AI skills within the workforce is crucial. Non-technical staff will also need training to adapt to the evolving skill requirements. Finally, leaders should deploy an HR strategy and operating model that aligns with the post-generative AI workforce.
- **Pursue executive education on automation technologies:** Leaders also need to embark on their own education journey regarding automation technologies to maximise their contributions during the transformation. This includes empowering senior managers to explore the implications of automation technologies and subsequently serve as role models, as well as uniting all company leaders to create a dedicated roadmap that drives business and employee value.

7. *Lifelong learning; adult learning*

To remain competitive in the fast-moving digital labour market, companies must regularly rethink their business models and **anticipate trends**. Since the greatest assets of most companies are their employees, a key task for companies is to constantly recruit innovative employees and adapt their existing workforce to digital trends.¹⁷⁰ After all, they need people with the skills necessary to **develop the new business models**. At the same time, new positions must be found within companies for employees whose work is changing as a result of digitalisation. Especially in European countries, there are restrictive protections against dismissal. **Retraining** is fairer from the employee's point of view and is increasingly cost-effective due to the war for talent in many countries. In addition, **lifelong learning** and the **implementation of regular further training** courses are also often suggested by employee representatives and employers as a defence against digitalisation-related job losses. Although training for employees is not always effective in the short term, over a longer period it can help secure promotions and changes in position for the better.¹⁷¹

170 Download at <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/changing-nature-work-and-skills-digital-age>, 29 (last accessed on 3 September 2024).

171 See <https://workforceinsights.randstad.com/hr-research-reports-flexibilitywork-2019> p. 40 (last accessed on 3 September 2024).

Investing in **lifelong learning** has many benefits for forward-thinking organisations. First, it serves as a **future-proof investment**, as companies recognise that the motivation and expertise of their employees are essential to ensure sustainable success. Lifelong learning contributes significantly to this goal. In addition, promoting **sustainable human resource policies** through continuous learning programmes enables companies to invest in the skills and talents of their employees. This cultivates a motivated and high-performing workforce and eliminates the need for external talent acquisition, saving both time and money. Furthermore, organisations can strategically direct the content and learning stimuli their employees receive, enabling them to develop their workforce in alignment with business objectives. In a highly competitive talent landscape, **sophisticated learning programmes** can become a **competitive advantage** for organisations by effectively addressing talent shortages. Moreover, providing learning opportunities increases employee satisfaction, reduces turnover and retains knowledge within the organisation. This, in turn, increases employee retention and contributes to the overall success of the organisation.¹⁷²

The retraining system must be able to help workers **keep abreast of technological change**.¹⁷³ As the ‘half-life’ of skills (meaning how long a skill remains relevant and valuable) is already less than five years and expected to decrease,¹⁷⁴ the need to learn new skills is greater than ever. In particular, further training should not be provided just for the sake of it; it must offer significant added value for the individual concerned. This includes the **regular introduction of new training and further training models**, and not just formal learning in a school setting.¹⁷⁵

By 2027, AI and big data will make up more than 40 per cent of technological training programmes.¹⁷⁶ In order to cope with this, six out of ten workers will require training before then, but only half of workers have access to adequate training opportunities.¹⁷⁷ The **extent of the need for further training** is shown by the fact that companies rate AI and big data 12 places higher in their skills strategies than in the assessment of their core competencies. They further indicate that they spend an estimated nine per cent of their retraining efforts in this area.¹⁷⁸ Low-skilled workers are most in need of training to adapt to a digitalising workplace, but fewer of these receive the required training compared to the

172 Dogu, ‘Kontinuierliches Lernen – Die Bedeutung für Unternehmen sowie die Ansätze des kontinuierlichen Lernens in einer sich immer schneller verändernden Arbeitswelt?’ in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023), 297.

173 See www2.deloitte.com/de/de/pages/trends/future-of-work.html (last accessed on 3 September 2024); www.linkedin.com/pulse/understanding-challenge-decreasing-skills-half-life-work-futurist?trk=public_profile_article_view (last accessed on 3 September 2024).

174 See www.bcg.com/publications/2023/reskilling-workforce-for-future (last accessed on 3 September 2024).

175 See n 170 above.

176 See n 5 above.

177 *Ibid.*, 7.

178 *Ibid.*, 43.

high-skilled workers.¹⁷⁹ At present, at least **37 per cent of European employees lack basic digital skills**.¹⁸⁰

It is precisely the lack of digital skills that may prevent many EU companies from fully profiting from opportunities emerging in the digital economy.¹⁸¹ For that reason, the **Reskilling Revolution** of the World Economic Forum (WEF) was launched in January 2020, aiming to give one billion people better educational and economic opportunities by 2030.¹⁸² The ambitious program is preparing the global workforce with the skills they need to future-proof their careers, as technologies like AI enable greater automation.

Legislation should also **promote further training and lifelong learning**. Some countries already have regulations to this effect: In **Austria**, for example, employees have the option of choosing between **unpaid educational (training) leave** and **part-time work during training**. In the latter case, the further training takes place alongside the job, and the trainee receives state benefits to compensate for the wages lost as a result of the reduction in working hours.¹⁸³ Employers must give their employees time off from work and, in cases of long-term retraining, arrangements for substitution must be made.

German lawmakers have followed suit and made further training on the job more attractive.¹⁸⁴ The relevant act also provides for a state subsidy of training costs for employees in an existing employment relationship. The employer is subsidised with a contribution to wages if they allow the employee to take time off work for training that falls within the period of employment. Freelancers (such as platform workers) are also reimbursed for training costs.¹⁸⁵ Such services are no longer only provided in the context of unemployment. Both employees and employers can be reimbursed a portion of the expenses incurred. The funding aims to **support the further training of employees** whose activities are **affected by the structural transformation** (eg, because of digitalisation), or those who are in special demand ('bottleneck professions').

Nevertheless, each company must actively contribute to the shaping of this digital change to remain internationally competitive in the long term. However, it is

179 See https://read.oecd-ilibrary.org/science-and-technology/measuring-the-digital-transformation_9789264311992-en#page1, 134 (last accessed on 3 September 2024).

180 Download at <https://digital-strategy.ec.europa.eu/de/library/digital-economy-and-society-index-desi-2022>, 24 (last accessed on 3 September 2024).

181 See n 170 above.

182 See <https://initiatives.weforum.org/reskilling-revolution/home> (last accessed on 3 September 2024).

183 See www.oesterreich.gv.at/themen/arbeit_und_pension/aeltere_arbeitnehmer/1/2/Seite.2010140.html (last accessed on 3 September 2024).

184 See www.bmas.de/DE/Arbeit/Aus-und-Weiterbildung/Weiterbildungsrepublik/Die-wichtigsten-Gesetze-im-Ueberblick/die-wichtigsten-gesetze-im-ueberblick-artikel.html (last accessed on 3 September 2024); www.heise.de/newsticker/meldung/Qualifizierungsgesetz-Bundestag-staerkt-digitale-Weiterbildung-und-ALG-Anspruch-4236480.html (last accessed on 3 September 2024).

185 See www.heise.de/newsticker/meldung/Qualifizierungsgesetz-Bundestag-staerkt-digitale-Weiterbildung-und-ALG-Anspruch-4236480.html (last accessed on 3 September 2024).

not only companies that need to equip themselves for the future by developing innovative business ideas and retraining their personnel; all **employees** are also **under pressure to actively improve their own appeal to employers**.

As job requirements change frequently, and flexibility becomes the norm, **employment contracts** may need to become **more flexible**. For example, they should potentially contain relocation clauses and reskilling clauses.

8. *Elements of digital learning*

Digital learning is an increasingly important aspect of lifelong learning. For one thing, digital learning describes learning with **digital media**. For another, digital learning also includes **learning content** and refers to the teaching of digital skills.¹⁸⁶

Digital knowledge includes an understanding of conceptual methods of data handling, an awareness of sensitive data rules, and an understanding of digital ethics. It also includes familiarity with the theories, methods, and scope of digital communication and interaction. In terms of **digital skills**, employees should be able to efficiently handle, secure, organise, and use information and data. They need to be adept at managing new technologies and building interpersonal relationships in the digital realm. Effective digital communication, collaboration, conflict resolution, and ethical considerations in handling big data and personal privacy are also essential competencies.¹⁸⁷

Digital learning offers several benefits for employers and employees. The strategic orientation of digital learning within corporate management leads to an **increase in innovation**, overall performance, and digital transformation within the company in the long term.¹⁸⁸ Encouraging digital learning among existing individual employees is proving to be an effective approach that both upgrades their skills and satisfies their desire for new challenges. Nearly 70 per cent of respondents to a global survey said they lack the skills needed for digital transformation. Through digital learning, companies can rapidly evolve into **learning organisations** by fostering collaboration and agility. In addition, **learning analytics** provide insight into employee learning progress and behaviour, enabling targeted management and user-centric approaches.¹⁸⁹

Five of the top ten **future skills** are directly related to digital learning: digital communication, digital literacy, digital strategy, virtual work, and technical

186 Matthes, 'Digitales Lernen?' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 305.

187 *Ibid.*

188 See https://media.kienbaum.com/wp-content/uploads/sites/13/2021/06/Kienbaum-StepStone-Studie_2021_WEB.pdf (last accessed on 3 September 2024).

189 See n 186 above.

understanding.¹⁹⁰ Nearly one in two professionals want **personalised development opportunities** and more **virtual networking formats**. However, digital and personalised learning methods are used in barely more than one in four organisations.¹⁹¹ Investing in these methods could increase job satisfaction, harness innovation, and foster positive attitudes toward change by cultivating necessary skills amid what is often perceived as overwhelming change.¹⁹² In addition, digital learning helps address the **growing diversity** of the workforce. Employees returning to work after an illness can be supported digitally, and parents and caregivers can be given easier access to digital training programs. Part-time employees can also benefit from digital learning materials, as they can access them anytime and anywhere.¹⁹³ Digital learning is also a sustainable alternative to extensive travel, providing cost-effective ways to collaborate and learn with colleagues, international partners, suppliers, customers, and others spread across different locations.¹⁹⁴

The introduction of digital learning also poses some challenges. For example, managing the **social distancing** associated with digital learning is critical. The most important prerequisite for all employees to learn to stay connected in the digital world is a **digital mindset** at the individual level. However, if learning is left solely to each individual's self-motivation, there is a risk that goals and approaches will not be aligned, leading to overload and inefficiency. The abundance of digital learning opportunities can also sometimes feel like an **information overload**, leading to stress and defensiveness. Furthermore, if employees fear that they do not have the necessary skills to succeed in a changing work environment, there is a risk that they will resist change. In addition, digital learning often lacks close support from colleagues, managers or coaches, which leads to a lack of sustainability. Neglecting these didactic prerequisites for success leads to ineffective learning outcomes.¹⁹⁵

To address these challenges, learning, especially in the digital domain, must be integrated into a supportive **learning ecosystem** to minimise randomness, inefficiency or lack of connectivity and context. This ecosystem requires **collaboration** between multiple stakeholders, and significant investment in robust and dynamic training systems for employees. HR must provide clear concepts for the short-term development of employees' digital skills and take on a remedying, quality-assurance and connective role.¹⁹⁶ To invest effectively, organisations need **well-aligned, easy-to-use and flexible digital learning ecosystems**. Understanding current competencies, determining key skills gaps, identifying high-demand skills in the workforce and providing appropriate learning pathways

190 See n 188 above.

191 *Ibid.*

192 See n 186 above.

193 *Ibid.*

194 *Ibid.*

195 *Ibid.*

196 *Ibid.*

are critical. In addition, it is important to ensure that the system adapts to ongoing changes in the digital skills landscape. The digital learning offering should be responsive to the **continuous reassessment** and contextual determination of the canon of digital skills, anticipating that what are described as technical skills today may be considered generic digital skills tomorrow.¹⁹⁷

9. Social acceptance of AI and digitalisation

A major issue regarding the introduction of AI in companies and the enforcement of international standards is **people's differing perceptions of AI**. While most **experts are optimistic** about the future ('enough new jobs are being created'), many **people are concerned or even pessimistic**.¹⁹⁸ They fear that in the future they will no longer have the necessary skills, or will be replaced through automation and innovation because they are unable to keep up with the rapid technological changes.¹⁹⁹

However, these doubts have already diminished in recent years. Between 2018 and 2023, optimism has risen (35 per cent to 52 per cent) and concern has fallen (40 per cent to 30 per cent).²⁰⁰ Still, these **different attitudes must be considered** when **integrating AI**. Therefore, both companies when they implement AI systems and lawmakers when they enact AI legislation must consider the following questions when dealing with AI:²⁰¹

- what (legal) framework is necessary to promote the ethical development of AI while also limiting its unethical implications?;
- what **framework** will **not be rendered obsolete too soon** by the rapid changes in AI innovations after publication?;
- how can **AI** be **protected from possible abuse** by itself or by third parties?; and
- what **guidelines** are **needed to protect workers**, or **is it necessary** to explicitly protect workers?

Numerous approaches are being developed around the world to make the use of AI trustworthy. Two regulatory initiatives stand out due to their binding legal character: the **EU AI Act** and the **AI Convention of the Council of Europe**.

197 *Ibid.*

198 See www.forbes.com/sites/cindygordon/2023/02/25/kpmg-global-study-confirms-trusting-ai-remains-a-major-confidence-gap/ (last accessed on 3 September 2024).

199 See www.edelman.com/research/trend-eroding-trust-tech-continues (last accessed on 3 September 2024).

200 See www.bcg.com/publications/2023/what-people-are-saying-about-ai-at-work (last accessed on 3 September 2024).

201 See <http://www.oecd.org/going-digital/ai-intelligent-machines-smart-policies/> (last accessed on 3 September 2024).

The **AI Act** agreed by the Council and the EU Parliament, which entered into force **on 1 August 2024**, pursues a horizontal and thus **cross-sectoral regulatory approach**. The scope of application covers the development, circulation and use of AI systems by private and public actors alike. The greater the risk of an AI system, the stricter the regulation (**risk-based regulatory approach**). Four levels of risk are outlined:

- unacceptable risks (eg, social scoring systems and manipulative AI) are prohibited;
- high-risk AI systems are regulated;
- AI systems with limited risk (eg, chatbots and deepfakes) must be labelled; and
- minimal risk is unregulated.²⁰²

The Council of Europe's AI Convention, which was adopted on 17 May 2024, aims to create an international legal framework – a global standard. The negotiations are attended not only by the 46 Member States of the Council of Europe, but also by observer states such as the US, Canada, Japan, Israel and Mexico. States that commit to this standard thereby indicate that the AI developed and used in that state is trustworthy. This can set an internationally valid, legally binding standard for trustworthy AI.

In terms of content, the AI Convention delineates general requirements for the design, development and use of AI systems, as well as the fundamental principles for the deployment of AI. It identifies potential risks associated with the utilisation of this technology, including the possibility of discriminatory and biased practices, and outlines strategies for mitigating these risks, such as the establishment of accountability measures and the formulation of principles of responsibility.²⁰³

In this context, the draft EU directive on AI liability has also been published to create a harmonised legal framework at the EU level and fill liability gaps. The aim is to introduce a liability framework for damage caused by AI. In doing so, the EU Commission wants to counteract the 'black box' problem – ie, that at a certain point, the technical and algorithmic conditions underlying the AI decision can no longer be understood. In essence, the directive establishes disclosure obligations and a presumption of causality: ie, rules regarding the burden of proof in national court proceedings.²⁰⁴

202 Final draft of AI Act by EU Council and European Parliament. Download at <https://artificialintelligenceact.eu/de/das-gesetz/> (last accessed on 3 September 2024).

203 See www.coe.int/de/web/portal/full-news/-/asset_publisher/y5xQt7QdunzT/content/id/267650696?_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_y5xQt7QdunzT_languageId=en_GB#p_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_y5xQt7QdunzT (last accessed on 3 September 2024).

204 See https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX:per_cent3A52022PC0496 (last accessed on 3 September 2024).

General aspects of non-contractual, fault-based liability (eg, where there is damage subject to compensation) are not to be redefined, leaving in place the varying rules of the individual Member States.

In addition, before introducing any new technology that will replace workers or change the worker's daily tasks, **awareness campaigns may be necessary** to show affected people how they will benefit from technological change.

Particularly in areas characterised by empathy, such as healthcare and homecare, research to enhance social acceptance of AI and robots among persons in need of care is becoming increasingly intensive. In addition to the practical added value (eg, vacuum cleaners modelled on dogs and care robots), robots must earn the empathy of their users, which is, however, a higher cost factor.²⁰⁵

To achieve social acceptance of AI on a broader scale, the **costs for products** must be **kept within reasonable limits**. It is to be expected that discussions among employee representatives about ethical principles and the value of human work will intensify if the introduction of AI is associated with extremely high costs. The often-cited accusation is that the money could have been invested in employees and retraining.

²⁰⁵ See <https://money.cnn.com/2018/08/22/technology/spotmini-robot-dog/index.html> (last accessed on 3 September 2024).

E. IMPACT OF AI BY COUNTRY

In recent years, numerous surveys have been published about digitalisation and its effects on the labour markets of individual countries. In the **US**, for example, automation itself – **not including generative AI** – could take over **21.5 per cent of working hours** in the US economy by **2030**. With **generative AI included** this figure rises to **29.5 per cent**. In the **EU**, it is predicted that **27 per cent of working hours** could be automated by generative AI.^{206, 207} These developments are expected to manifest in labour markets by creating a necessity for workers to transition into different occupations. By 2030, in a scenario of accelerated adoption, **Europe** might see a need for up to **12 million occupational transitions**, impacting **6.5 per cent of current jobs**. In the **US**, a similar scenario could necessitate nearly **12 million transitions**, affecting **7.5 per cent of current jobs**.

I. Exposure and complementarity by country

Approximately **40 per cent of workers worldwide** are in high-exposure occupations, with the proportion higher in **advanced economies at around 60 per cent**. This suggests a significant macroeconomic impact.

In **advanced economies**, a large proportion of employment is in high-exposure occupations, with varying degrees of complementarity. In highly developed countries, 27 per cent of workers are employed in high-exposure, high-complementarity occupations, and 33 per cent in high-exposure, low-complementarity occupations. For example, almost 70 per cent and 60 per cent of jobs in the UK and US, respectively, are in high-exposure occupations, which are roughly evenly split between high and low-complementarity occupations.

In **emerging countries**, the proportion of occupations with high exposure and high complementarity is 16 per cent. In **low-income countries**, it is eight per cent. The proportion of high exposure, low complementarity is 24 per cent in emerging countries and 18 per cent in low-income countries.

The composition of the working population largely explains the differences in exposure and complementarity between countries:

- in the **UK**, for example, a significant proportion of the workforce is made up of **professionals and managers**, who have high exposure and high complementarity, and office workers, who have high exposure and low complementarity;
- in **India**, by contrast, the majority of the workforce is employed as **artisans, farmers, or in low-skilled jobs**, most of which have low exposure; and

²⁰⁶ See n 64 above.

²⁰⁷ *Ibid.*

- in advanced economies, with their large proportion of low and high-complementarity occupations, the introduction of AI may lead to more pronounced shifts in the labour market. For them, there is a risk of displacement in some occupations, but also an opportunity for growth in others. In **low-income countries**, there are fewer occupations with high exposure to AI, leading to **lower productivity effects** from AI. Additionally, most high-exposure jobs in low-income countries **lack significant complementarity** with AI, leading to **full automation rather than augmentation**. Consequently, AI automation is likely to **exacerbate economic disparities** between low-income and highly developed countries.

II. Fears of job loss: contrasts between East and West

A recent survey has revealed a significant discrepancy in the **fear of job loss** due to generative AI between white-collar workers in the Asian economic sphere and those in the Western world. In countries like **India and China**, **80 per cent** of respondents expressed concern about losing their jobs to AI, followed by **73 per cent in Singapore and 67 per cent in Indonesia**. Conversely, in the **UK and US**, **only 51 per cent and 50 per cent** respectively voiced such fears. Even more notably, in **Germany only 31 per cent** of respondents expressed these concerns.²⁰⁸

These figures could suggest that Western white-collar workers have greater abilities and are more confident in their abilities and less apprehensive about AI replacing them. However, this may be a classic case of the **Dunning-Kruger effect**. Many individuals in the Western world may be unaware of the capabilities of generative AI and overestimate their own skills. This hypothesis is supported by a Eurostat study, which found that **only 55 per cent of EU citizens possess basic digital skills**.²⁰⁹

Given that the introduction of generative AI is predicted to have the greatest impact in Western countries, urgent action is needed to **address this cognitive disparity**. While these countries may have the highest proportion of workers with high AI exposure and complementarity, making them the ‘winners’ of the AI wave, it is also necessary to consider that reaping the benefits of AI support also **requires digital skills**.

208 See www.oliverwymanforum.com/content/dam/oliver-wyman/ow-forum/gcs/2023/AI-Report-2024-Davos.pdf (last accessed on 3 September 2024).

209 See <https://ec.europa.eu/eurostat/de/web/products-eurostat-news/w/ddn-20231215-3#:~:text=Inper cent2023per cent2Cper cent2056per cent25per cent20ofper cent20people,individualsper cent20publishedper cent20byper cent20Eurostatper cent20today>. (last accessed on 3 September 2024).

III. AI Economic Impact Index (winners/losers by country)

In this context, the AI Economic Impact Index provides a tool for assessing which economies are best positioned to benefit from AI over the next few decades. The index uses 40 sub-indicators to build **three pillars** covering the critical factors that influence AI's impact: **innovation, diffusion, and adaptation**, resulting in a composite **score** (X out of 100).²¹⁰

The **US**, with a score of **70**, ranks first, indicating its potential to maintain its role as a **global technological leader**. This score reflects the country's size, increased public and private R&D investment, and a rapidly expanding higher education system. The US leads in innovation, largely due to the dynamism of its private sector and substantial private investment in AI, along with the highest number of AI start-ups in any country. As both a user and provider of AI with companies such as Meta, Amazon, and Microsoft, which heavily invest in AI technologies, the leadership of the US is evident even on a per capita basis.²¹¹

China, scoring **43**, excels in **innovation due to significant investments** from both the public and private sectors since AI was prioritised nationally in the mid-2010s. However, China **ranks lower in diffusion**, largely due to regulatory oversight aimed at ensuring compliance with **copyright rules and other governmental directives**. This oversight, along with efforts to control the tech sector, hinders widespread adaptation, placing China in 18th place in the index despite leading in some innovation areas.²¹²

Other high-ranking economies include **Singapore (60)**, **South Korea (52)**, and the **UK (56)**. Singapore, in second place, along with South Korea and Hong Kong, performs well in **diffusion and adaptation** due to its rapid adoption of technology and export-led development models. The Singaporean government has initiatives such as the Government Sponsored Management Program, which offers AI courses and financial incentives for participation. South Korea's ability to quickly replicate and improve on foreign technologies, such as in the heavy industry and digital TV markets, exemplifies this adaptability. The **UK**, ranking third, stands out despite its low investment rate due to its **world-class higher education system** attracting top global talent, contributing to a high **innovation** score. The services-oriented UK economy also facilitates rapid **AI diffusion**, and its flexible labour market aids broader economic adaptation.²¹³

Japan, with a score of 45, and **most Eurozone economies** (EU: 41, Germany: 47, France: 42, Italy: 33) fall between the US and China in the rankings. Japan's strong history of technological innovation and demographic challenges could speed up AI adoption, though it struggles with technology diffusion. The Eurozone

210 See www.capitaleconomics.com/consultancy-ai-economic-index (last accessed on 3 September 2024).

211 *Ibid.*

212 *Ibid.*

213 *Ibid.*

faces several constraints, including a less developed venture capital industry and poor cloud infrastructure, hindering its innovation potential. Structural issues, such as inflexible labour markets and stringent regulations, further limit AI diffusion compared to the US.²¹⁴

Emerging markets (EMs), particularly those outside Asia, rank lower, with **India** scoring 24, **Russia** scoring 21, **Brazil** and the **Middle East** scoring 19, and **Latin America** and **Africa** scoring 16. Factors such as low private sector dynamism, underdeveloped IT sectors, limited R&D investment, and brain drain inhibit their capacity for technological innovation and slow technology diffusion. **LLMs** pose a **threat to services-led development in emerging markets**. Generative AI, particularly LLMs, can revolutionise tasks in services such as customer support, IT support and creating personalised promotional emails. These tasks are often formulaic and repetitive, meaning that AI can replace human workers, as seen with chatbots. Many of these tasks are **currently outsourced** to low-income emerging markets, commonly referred to as the business process outsourcing (BPO) sector. The risk is that Western firms paying for BPO services will increasingly decide to **perform them in the cloud**. It is possible to posit that developing countries are adopting AI technology at a faster rate than developed countries. This may be because there are fewer social and political barriers to entry, and social acceptance is greater when AI is seen as development aid.²¹⁵

In conclusion, the AI Economic Impact Index indicates that the **US will lead the AI revolution**, with Singapore, the UK, South Korea, and other advanced economies well-placed to benefit. **China** will excel in some areas but face challenges in others, potentially becoming a **new fault line in the global economy**. For **EMs**, AI may make **income convergence harder** as richer economies are better equipped for widespread AI deployment, though AI's transformational potential in areas like healthcare and education remains significant.²¹⁶

IV. Key factors for successful countries

In the future, the **innovative capacity** of a country and its companies, **technological (learning) readiness**, and the **efficiency of employees** will be more important than other criteria for determining a country's competitiveness.²¹⁷

1. *Life-long learning and digital literacy of employees*

The ever-shorter innovation cycles will place even more emphasis on further training on the job.²¹⁸ Technologies have the potential to automate work activities

214 *Ibid.*

215 *Ibid.*

216 *Ibid.*

217 See www.weforum.org/reports/the-global-competitiveness-report-2018 (last accessed on 3 September 2024).

218 See n 64 above; see n 5 above, 42.

that today take up 60 to 70 per cent of employees' time.²¹⁹ For this reason more and more **non-formal qualifications (eg, social skills)** are expected of employees. These include, for example, the ability to act and decide independently, to build networks independently, to organise themselves and their teams with a focus on targets, and to think abstractly and creatively. **Specialist knowledge** will become **less important**, since this work is likely to be done by intelligent software or a machine.²²⁰ In order to check and implement the subject-specific information provided by an intelligent algorithm, **every employee** should have **fundamental technical knowledge**. It is crucial that all workers can use key digital technologies.

Technically skilled users can **save valuable time**, regardless of their specific job, by using AI that, for example, automatically writes emails, manages calendar entries and provides answers to complex questions.²²¹ The same can be said of big data analyses which facilitate decision-making. Digitalisation therefore can provide **process optimisation in all jobs** and should therefore be mastered to some extent by every worker in every industry and every country.

Digital education starts at school, should be intensified at university, during training, or at vocational school, and must be regularly refreshed or supplemented during an employee's working life. It is therefore positive that the EU is investing €580m in the digital skills of citizens through the Digital Europe Programme²²² and that numerous Member States, such as Austria, have enacted laws that support the further training of employees in their working lives.²²³

China is taking the **most forward-looking path** in terms of education policy. A textbook called *Dealing with AI* has been available for lower secondary school pupils since April 2018, and some primary schools are already teaching how to deal with AI.²²⁴ The entire process was implemented in China in just a few months. Western countries, however, are just beginning to include AI like ChatGPT in their teaching. AI is still not included in curricula as a separate school subject or explained further at school.

A) INCORPORATION OF DIGITAL TECHNOLOGIES INTO DAILY LIVES

The more people encounter digital technology in their everyday lives, the easier it will be for them to use it or other advanced technology in their working environment.

219 See n 21 above.

220 See www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce (last accessed on 3 September 2024).

221 See www.bbc.com/worklife/article/20230515-workplace-ai-how-artificial-intelligence-will-transform-the-workday (last accessed on 3 September 2024).

222 See <https://digital-skills-jobs.europa.eu/en/about/digital-europe-programme> (last accessed on 3 September 2024).

223 See www.arbeiterkammer.at/beratung/bildung/bildungsfoerderungen/Bildungsteilzeit.html (last accessed on 3 September 2024).

224 See www.scmp.com/tech/china-tech/article/2144396/china-looks-school-kids-win-global-ai-race (last accessed on 3 September 2024).

The use of digital technology in turn depends primarily on its social acceptance. This is usually achieved by providing the user with a secure, user-friendly service that offers specific added value for the individual concerned.

To **determine the prevalence** and also the **acceptance of technical innovations in the EU Member States**, the EU Commission has published the Digital Economy and Society Index (DESI) every year since 2014.²²⁵

Four criteria are used to determine the scores in the DESI:²²⁶

- **human capital:** internet user skills, advanced skills, and development;
- **connectivity:** access to broadband internet and costs;
- **integration of digital technology:** basic digital skills, internet usage, and development and integration of digital technologies into daily life; and
- **digitalisation of public administration** including option to file applications online

The leading European country with a DESI of 70 is Finland, closely followed by Denmark, the Netherlands, and Sweden. France and Austria have a DESI of 54, while Germany's is 53. The lowest DESI values are observed in Eastern Europe, with scores in the 40s and 50s. The average index for the EU Member States is 52.²²⁷

B) DIGITAL ECONOMY IN ADMINISTRATION

While globally connected companies are starting to use intelligent systems, **government authorities** in most countries are **still lagging**. One of the best e-government rankings is held by Denmark, followed by Finland and South Korea:²²⁸ **Denmark**, a country with a population of 5.8 million, is a world champion and **pioneer** in the **field of e-government**.²²⁹ Denmark achieved this through simple means: the government issues one ID for each citizen and operates one portal with which almost every government service can be accessed, for example registering a change of address or applying for a pension. Three factors make this model for e-government possible:

- **User acceptance:** Administrative procedures are simplified for the user by using few IT systems. The citizen services of municipalities and employees

225 See n 41 above, 3.

226 *Ibid*, 4.

227 *Ibid*.

228 See <https://unric.org/en/denmark-finland-and-south-korea-top-the-2022-un-e-government-ranking/> (last accessed on 3 September 2024).

229 See www.vdz.org/digitalisierung-der-verwaltung/warum-daenemark-weltmeister-im-egovernment-ist#:~:text=per centC3per cent9Cberper cent20dasper cent20Portalper cent20lper centC3per centA4uftper cent20die,Renteper cent20beantragenper cent20undper cent20ihreper cent20Gesundheitskarte (last accessed on 3 September 2024).

in libraries are specially trained to provide digital support for those who struggle with the IT systems.

- **Investment:** Denmark invested heavily in its e-government program and AI.
- **Security:** Security on the Danish online portal is high: various authentication features are required to log in.

2. *Public and private investments*

Every revolution, including the digitalisation of the working environment, requires radical change. This **radical change** first takes place **in the minds of the people concerned**, who should see technical innovation and the introduction of AI not as a job killer and risk factor, but as an opportunity for prosperity. At the same time, a ‘technical upgrade’ also costs money. Both companies and governments inevitably must invest heavily.

Governments worldwide have a crucial role to play in the development and deployment of AI technologies. In the **last five years**, the **US** has led global AI investment with **US\$328.5bn**, primarily directed toward research and development in universities and public institutions. The US is followed by **China**, which invested approximately **US\$195bn** in the same period, focusing on national AI strategies and large-scale AI infrastructure projects. The **UK** also ranks highly at **US\$25.5bn**, emphasising AI integration in public services and healthcare.²³⁰

Private sector investment in AI has also seen substantial growth. In **2023**, global corporate AI investment surged to **US\$142.3bn**. In 2023, the **US** secured its position as the **top investor in AI**, with **private investments** amounting to **US\$67.2bn**, marking a 22.1 per cent increase from the previous year.²³¹ This investment is significantly higher than that of **China**, the **private sector of which invested US\$7.7bn**. In 2023, private investment in the AI sector in the **EU** was estimated at over **US\$7.9bn**.²³² This growth in the US and in Europe was driven significantly by major tech companies such as Amazon, Google, Microsoft, NVIDIA and Salesforce, which together accounted for two-thirds of the US\$27bn raised by emerging AI companies. Notably, OpenAI secured the highest investment among AI start-ups, amassing US\$14bn through partnerships with Microsoft and other major investors.²³³

230 See <https://edgedelta.com/company/blog/ai-investment-statistics> (last accessed on 3 September 2024).

231 See <https://aiindex.stanford.edu/report/> (last on accessed 3 September 2024); www.weforum.org/agenda/2024/05/these-5-countries-are-leading-the-global-ai-race-heres-how-theyre-doing-it/ (last accessed on 3 September 2024).

232 See <https://techxplore.com/news/2024-01-eu-microsoft-investment-openai.html> (last accessed on 3 September 2024).

233 See n 230 above.

The **US** is a **global leader in AI investment**, with substantial public funding driving extensive research and development efforts. This investment ensures that American companies remain at the forefront of AI innovation, driving global standards and technological advancements. The substantial investment in AI by both the government and private sector has led to rapid development, resulting in breakthroughs in various fields, including healthcare, manufacturing, and financial services. This strategic positioning has also bolstered the US economy by fostering a robust AI ecosystem that attracts global talent and investment, thereby maintaining the country's competitive edge in the international market.²³⁴

The US and its companies appear to be leaving the world behind in the development and introduction of AI, just as it is surpassing much of the world economically.

3. *Connectivity through high-speed internet*

The basic prerequisite for a digital economy is **efficient digital infrastructure** because the amount of data and the number of devices connected at any given time are increasing daily. Without a widespread 5G network, many technologies such as autonomous driving will not be accessible to the public.²³⁵ The internet must be available in all walks of life.

²³⁴ *Ibid.*

²³⁵ See www.sciencedirect.com/science/article/abs/pii/S2214209622000985#:~:text=5Gper cent20offersper cent20enhancedper cent20mobileper cent20broadband,comfortper cent2Cper cent20safetyper cent20andper cent20efficientper cent20driving (last accessed on 3 September 2024).

F. THE IMPACT OF DIGITALISATION/AI ON EMPLOYMENT RELATIONSHIPS

When considering AI and labour and employment law, most aspects of modern work will entail data privacy issues. Thanks to a high level of automation, analyses and reporting at the touch of a button, as well as bots and apps, the range of digital reports is greater than ever before. In addition, intelligent technology can **recognise patterns**, learn from previous applicants, and thus **find optimal applicants** for a vacant position. In the case of HR, e-recruiting is not intended to replace recruiters, but it does relieve them of repetitive work like answering applicants' initial questions.²³⁶ **Recruiters have more time** and just need to be fast to win the race for highly skilled talents. This gives HR teams the opportunity to focus more on strategic, higher-level goals.²³⁷ However, they must consider data protection in their daily work while also creating a modern employment relationship. The right work environment depends on offering a personalised experience, which in turn means developing new skills, new role profiles, an onboarding culture, and personalised compensation and benefits corresponding to the individual's circumstances.²³⁸

Regarding workplace cooperation, the trend is increasingly toward 'skills-based organisation', an 'operating system' for organisations that relies on **skills as fundamental building blocks** instead of complete roles. Such an operating system is not only intended to enable more flexibility for organisations and employees, but also to introduce new models of employment, participation and career development, which because of the change in technology and increasing complexity are increasingly in demand.²³⁹

Most organisations focus primarily on strategic workforce planning:

- enabling the determination of current and future personnel requirements;
- identifying existing skills as well as skills gaps; and
- determining which of the skills that are not available can be developed internally and which must be recruited externally.²⁴⁰

236 See <https://softgarden.com/de/recruiting-trends-2019/> (last accessed on 22 October 2024).

237 See www.phenom.com/blog/recruiting-ai-guide (last accessed on 3 September 2024).

238 See www.bakermckenzie.com/en/insight/publications/2019/07/-/media/files/insight/publications/2019/07/the-future-of-workfinal.pdf, 12 (last accessed on 3 September 2024).

239 See www2.deloitte.com/de/de/pages/human-capital/articles/skill-basierte-organisation.html (last accessed on 3 September 2024).

240 See www.mercer.com/assets/de/de_de/shared-assets/local/attachments/pdf-2023-global-talent-trends-dach-report-de.pdf (last accessed on 3 September 2024).

I. Hiring processes

Over 600 major companies (including Under Armour, Unilever, Goldman Sachs and JPMorgan Chase) use AI to recruit new applicants, and 55 per cent of companies surveyed by Aptitude Research are investing in **recruitment automation**.²⁴¹ These companies conduct interviews mostly via webcam. Unilever has been able to cut 70,000 person-hours spent interviewing and assessing candidates.²⁴² The interview video is analysed by a computer program to find out more about the personality of the applicant. The algorithm primarily captures facial expressions and gestures and compares how often the candidate uses positive verbs as opposed to negative ones.²⁴³ The AI-based **personality assessment** makes judgments regarding the applicants' decision-making process (instinctive or deliberative), learning style (adaptive or cognitive), emotions, generosity, risk tolerance, fairness, effort (hard-working or outcome-driven), focus (able to multitask), and attention when managing incoming information. The data are collated by AI to create a profile, which can then be compared with the job description to find out whether the applicant is a good fit or not. Overall, AI makes a more **efficient and cost-effective** recruiting process possible, decreasing the odds of wrong assessments.²⁴⁴

IBM uses AI primarily for quality assurance in human resources. The software works with extensive employee data (eg, school leaving certificate/high school diploma, previous experience, performance appraisals carried out by supervisors). By analysing the data, the algorithm creates a profile of the respective employee and thus offers numerous specific training opportunities. According to IBM, use of the software not only decreases the need for employees in the human resources department by a third, but also saves around US\$300m in recruiting and orientation costs.²⁴⁵

1. *GDPR and application processes*

When using web-based HR management software from third-party providers, it is important to consider that they process the applicant data only on behalf of the employer. This is external processing, meaning that the **employer is still responsible** for complying with data protection laws, and an external processing agreement is required.²⁴⁶

241 See www.forbes.com/sites/forbesbusinesscouncil/2022/06/10/artificial-intelligence-in-hiring-a-tool-for-recruiters/?sh=17293e793200 (last accessed on 3 September 2024).

242 See <https://bernardmarr.com/the-amazing-ways-how-unilever-uses-artificial-intelligence-to-recruit-train-thousands-of-employees/> (last accessed on 3 September 2024).

243 See www.businessinsider.de/karriere/bewerbung/so-funktionieren-bewerbungsgespraechе-mit-kuenstlicher-intelligenz/ (last accessed on 3 September 2024).

244 See <http://www.nysba.org/WorkArea/DownloadAsset.aspx?id=96335> (last accessed on 3 September 2024).

245 See www.tagesschau.de/wirtschaft/technologie/ibm-ki-arbeitsplaetze-100.html (last accessed on 3 September 2024).

246 See www.vku.de/fileadmin/user_upload/221025_KISS-Studie_RZ__002_.pdf (last accessed on 3 September 2024).

If the application is unsuccessful, the basic data must be deleted. Only data **necessary** for asserting personal rights may be retained. Therefore, the documents and data of the rejected applicants may be retained up until the end of the limitation period for any claims by rejected applicants against the employer. Further processing of the data (including even keeping data on file for other vacancies) requires the employee's consent.

2. *E-recruiting*

The introduction of AI and intelligent algorithms is creating completely new opportunities in business, especially in dealing with staff and obtaining new employees. What used to be done 'by hand' is now increasingly being performed by algorithms. Whereas it was necessary to search laboriously for information about an applicant, it is now possible to 'Google' the applicant's name and run background checks online. There are also several providers that offer online background checks, such as ShareAble and GoodHire.²⁴⁷

In addition to common **matching systems**, which match an in-depth applicant profile with the job profile and recommend candidates,²⁴⁸ **active sourcing tools** are increasingly being considered. These tools suggest suitable candidates whose profiles were found on social media platforms or online job exchanges.²⁴⁹ Companies no longer wait until the perfect match appears and instead actively search for the perfect match. For example, an AI computer agent conducting recruiting includes user profiles from LinkedIn in its virtual environment. Its pre-defined goal could be to automatically support the outreach process by identifying the most appropriate LinkedIn profiles for a given job profile. To achieve this goal, it reads all user profiles. Using its data analysis module, it examines them, compares them to the job profile stored in its knowledge base, and sorts them according to their suitability. In this context, tools for **analysing the personality structure** of applicants are also used to facilitate communication with the applicant. Such technology can analyse publicly available data on the internet to create a personality profile for a specific person.

Data suggest that 60 per cent of large organisations use **chatbots** for recruiting.²⁵⁰ Chatbots can relieve recruiters of tedious tasks by answering questions from potential applicants around the clock. Additionally, companies can actively use chatbots, for example, to conduct a preliminary meeting with a potentially promising applicant before inviting them to an interview. In this way, both sides can find initial exclusion criteria before going to the length of arranging a

247 See www.betterteam.com/best-background-check-services (last accessed on 3 September 2024).

248 See <https://workforceinsights.randstad.com/hr-research-reports-flexibilitywork-2019> p 14 (last accessed on 3 September 2024).

249 See <https://carerix.com/en/themes/search-match/> (last accessed on 22 October 2024).

250 See www.ere.net/articles/the-role-of-chatbots-when-hiring-many-people-or-none (last accessed on 3 September 2024).

meeting to get to know each other more. However, chatbots must make the same considerations as human recruiters must and make the position attractive to the applicant.²⁵¹ Dismissively repeating text that can be found on the homepage or asking petty and discriminating questions has a repulsive rather than inviting effect on applicants. Despite all the technical changes, the goal is still to recruit a person with their own individual needs into the company.

3. *Applicant screening via social media*

Social media can be assessed to obtain a neutral impression of an applicant.

Surveys show that 70 per cent of recruiters say they check an applicant's social media account before hiring them. Furthermore, 54 per cent have rejected applicants based on information found on social media. Social media sites provide a free, easily accessible portrait of an applicant that gives a clearer idea of whether that person will be successful on the job – or so the theory goes.²⁵² However, the **permissibility of data processing** in the EU depends on the purpose of the platform.

- Data processing is generally **permissible** if the data is publicly accessible (eg, Google), if the data is publicly accessible on a portal specifically intended for professional matters (eg, LinkedIn, New Work) and if the data is accessible only to members of a portal specifically intended for professional matters (eg, New Work).
- Data processing is generally **impermissible** if the personal data is publicly accessible on a portal specifically intended for private matters (eg, Facebook) and if the data is accessible only to friends on a portal specifically intended for private matters (eg, Instagram) and the employee has accepted the request for contact, unless the recruiter alluded to the data collection and data processing when making contact.

On Facebook or Instagram, it is not always easy to tell whether a profile is purely private or also professional. The permissibility of procuring information via social media therefore depends on the public accessibility of the information. If applicants make their Facebook profile public, there are good reasons for arguing that the employee has no objection to their data being obtained by third parties.

However, it must be noted that data protection law requires that there be no discrimination; the **principle of equal treatment** applies all over the world and prohibits employers from treating individuals unequally on grounds of race, ethnic origin, gender, religion or belief, disability, age or sexual orientation.²⁵³

251 See n 236 above.

252 See <https://hbr.org/2021/09/stop-screening-job-candidates-social-media> (last accessed on 3 September 2024).

253 Download at <https://link.springer.com/article/10.1007/s10672-021-09372-4#Sec2> p 288 (last accessed on 22 October 2024).

Furthermore, applicants may not be disadvantaged on the basis of their political views or union membership. Where employers check applicants' social media profiles lawfully, according to data protection law, they may not discriminate in favour of or against the applicants on account of their personal attributes. If data is collected using an intelligent algorithm, this should generally be programmed to obtain only permissible data. If discriminatory data is collected anyway, this malpractice is ascribed to the user, namely the employer.²⁵⁴ This also applies when a third-party tool is used.

4. *Background checks under EU law*

Automated data processing operations when verifying data and checking their application are now typical instruments in HR. Since these processing operations are **necessary in preparations for a contractual relationship**, corresponding data processing operations are generally justified, but a data privacy policy that provides information about the purpose of each particular data processing operation is required.²⁵⁵ Furthermore, background checks that reveal the identity of the applicant and are carried out secretly or without valid employee consent are generally impermissible under data protection law because they are often disproportionate.²⁵⁶ Therefore, there can be no general permissibility check. Instead, **each data processing operation is to be checked separately** for its compatibility (**general necessity and weighing of interests**) with the GDPR and national data protection law.

- Collecting **data on the applicant's suitability, experience, and qualifications** is generally permissible since objective decision criteria are not restricted by prejudice and are essential for establishing an employment relationship.
- Personality tests regarding **individual personality characteristics** (eg, classification into certain categories through the Myers-Briggs test)²⁵⁷ can be **permissible** if the personality characteristics are **job-related** and if the employer's legitimate interests outweigh the applicant's interest in the protection of their personal rights.
- A **personality analysis** regarding the applicant **in general** through keystroke dynamics, linguistic analyses, video analyses or other predictive models (eg, using texts) is **impermissible** without the employee's express consent since this is not necessary to establish the employment relationship.²⁵⁸

254 See www.datenschutzbeauftragter-info.de/uebertragung-der-haftung-nach-dsgvo-auf-den-arbeitnehmer/ (last accessed on 3 September 2024).

255 See www.tlnt.com/how-gdpr-affects-background-checking/ (last accessed on 3 September 2024).

256 See www.winheller.com/en/business-law/labour-employment-law/employee-data-protection.html (last accessed on 3 September 2024).

257 See <https://de.wikipedia.org/wiki/Myers-Briggs-Typenindikator> (last accessed on 3 September 2024).

258 See www.tlnt.com/how-gdpr-affects-background-checking/ (last accessed on 3 September 2024).

- Using **plagiarism software** for text analysis is **permissible** since the employer has a legitimate interest in not employing 'impostors'.
- Data collected and processed in an **assessment centre and unsolicited information** from the applicant (eg, if the applicant says in a telephone interview that he and his wife were recently on vacation) may generally be processed. However, if a request for information was impermissible (see above), the information may not be utilised and must be deleted.
- **Asking the former employer** about an applicant is permissible if there are justified doubts about the truth of the applicant's statements.

When using web-based HR management software from third-party providers, it must be considered that they process the applicant data only on behalf of the employer. This is external processing, meaning that the employer is still responsible for complying with data protection laws, and an external processing agreement is required.²⁵⁹

If the application is unsuccessful, the **basic data must be deleted**. Only data necessary for asserting personal rights may be retained. Therefore, the documents and data of the rejected applicants may be retained until the end of the limitation period for any claims by rejected applicants against the employer.²⁶⁰ Further processing of the data (including even keeping data on file for other vacancies) requires the employee's consent.

In addition, employers must inform the candidate during the application process of the **purpose of storing their information and the source** from which the personal data originate if they originate from publicly accessible sources or from third parties.²⁶¹ This information must be provided as part of a data privacy policy.

II. Existing employment relationships

In general, in the new world of work, work is becoming more flexible, leading to more freedom for employees and changing tasks in day-to-day business. Mobility clauses and open task descriptions will be part of new employment relationships. Besides these traditional individual labour and employment law issues, new legal challenges are emerging due to technological changes:

I. Practical use cases for AI in HR processes

Digitalisation and AI are changing HR entirely and, with it, existing employment relationships. The changes range from deployment and pay structure to suspension

²⁵⁹ See <https://resources.workable.com/tutorial/gdpr-checklist-recruiting-hr> (last accessed on 3 September 2024).

²⁶⁰ *Ibid.*

²⁶¹ *Ibid.*

and ultimate termination of employment relationships. Some of these areas of application are as follows:

- AI can and is increasingly being applied to **pay planning**. Cloud-based pay management software streamlines the process by providing tools for creating and managing various forms of pay, including salaries, bonuses and stock options. It integrates seamlessly with existing HR systems, ensuring smooth data exchange and consistent management of employee information. Such applications can create fair and transparent pay systems by making it easier to link pay to individual or team performance. Advanced analytics enable organisations to analyse pay data and make data-driven decisions. In addition, the software ensures compliance with government regulations and internal policies, while automating administrative tasks to increase efficiency. By providing a clear and flexible pay structure, this can increase employee engagement and satisfaction;
- **Human resources planning** is also being transformed by AI. This includes changes in how decisions about requests such as vacation, parental leave and part-time work are made (eg, chatbots for submitting requests). It also includes planning decisions such as vacation and shift schedules. AI-based systems can simplify and speed up the process of matching relevant employee data to support information delivery;
- AI can also help with **workforce development**. Just as in recruiting, it can analyse strengths and weaknesses and make recommendations for training and education; and
- digitalisation and AI are also having an increasing impact on **suspension and termination** of employment. AI can be used to detect compliance violations, issue warnings, create social compensation plans or prepare for terminations. This raises the issue of the possibility of continuous monitoring. Monitoring of this kind must be weighed against the privacy and data protection rights of employees (more on this in 2. Big Brother is watching you).

2. *Big Brother is watching you*

With the proliferation of technological tools, it is becoming easier for employers to **monitor employees** by checking their emails, internet use, social media profiles, company phones, cameras and GPS in company cars or phones. Employers have an added incentive to do so as AI can only learn by monitoring employees. To monitor the performance of employees, supervisors used to walk through the factory floor and count the quantities produced. Today they can look at the algorithmic analyses on their computer. As the amount of data in the company collected by different algorithms and intelligent machines increases, the risk increases that employees become more and more the object

of permanent surveillance. Such an encroachment on their **personal rights** and the **permanent pressure** of being monitored can also have a negative effect on employees' creativity and productivity.

There are a variety of approaches to implementing employee monitoring. In April 2020, global demand for employee monitoring software more than doubled. Online searches for 'how to monitor employees working from home' increased by 1,705 per cent, and sales for systems that track workers' activity via desktop monitoring, keystroke tracking, video surveillance, GPS location tracking and other digital tools went through the roof. Some of these systems purport to use **employee data to improve wellbeing** – for example, Microsoft is developing a system that would use smart watches to collect data on employees' blood pressure and heart rate, producing personalised 'anxiety scores' to inform wellness recommendations. But the vast **majority** of employee monitoring tools are **focused on tracking performance**, increasing productivity and deterring rule breaking.²⁶²

Amazon, for example, has applied for a patent for a **bracelet that records the hand movements** of logistics staff and vibrates to help them find the package they are looking for.²⁶³ The bracelet's 'haptic feedback' is intended to reduce time spent searching, and the staff are thus pushed toward greater efficiency. By recording the performance of individual employees, employers can compare them with other staff members. This pressure is intended to motivate the staff to increase their performance and work effort. When employees take breaks during regular working hours, the bracelet sends a vibration signal to remind them of the workload they should be achieving. The same signal is also issued if the bracelet notices that employees are working at a lower speed than others.²⁶⁴

A social media marketing company in Florida installed software on employees' work computers that takes screenshots of their desktop every 10 minutes and records how much time they spend on different activities. The company then uses this data to determine productivity levels and identify rule-breakers.²⁶⁵

It is also possible to monitor employees with common tools like **Microsoft Office 365**. In addition to emails and a calendar, the software can also incorporate **analytical tools**.²⁶⁶ This is primarily intended to help companies merge all available information without having to run the risk of data loss. At the same time, this analytical tool also produces a comprehensive profile of a person by connecting

262 See <https://hbr.org/2022/06/monitoring-employees-makes-them-more-likely-to-break-rules>, (last accessed on 3 September 2024).

263 See www.theguardian.com/technology/2018/jan/31/amazon-warehouse-wristband-tracking (last accessed on 3 September 2024).

264 See <http://pfg-net.de/kuenstliche-intelligenz-in-der-arbeitswelt-ueberwachung-statt-entlassung> (last accessed on 3 September 2024).

265 See n 262 above.

266 See <https://venturebeat.com/2019/01/02/microsoft-expands-myanalytics-work-tracker-to-all-office-365-users/> (last accessed on 3 September 2024).

to a single large pool of data. This makes the work processes of individual staff ever more transparent, and they can be assessed in relation to other factors, such as wages and working hours. This, too, can lead to constant monitoring of the performance of employees.

All these developments have a major impact on the personal rights of affected workers, as can be seen in the case of Amazon's bracelets. In this respect, it could be useful for a mutually amicable working relationship for the companies to establish greater transparency regarding potential monitoring measures and for employees to be involved in the decision-making process as much as possible.²⁶⁷ However, from a legal point of view, use of personal data as wide-reaching as Amazon's bracelet processes would not be permitted under European data protection law currently. Rather, the legal requirements depend on the type of employee monitoring in the individual case. Typical examples include the following.

A) ACCESS CONTROL

While total surveillance is impermissible, even in European countries electronic access control and time recording are **generally permissible** under data protection law, as the employer has a legitimate interest in such access controls.²⁶⁸ However, electronic access controls may only serve to identify the employee and not to create profiles of their movements or otherwise control employee behaviour. Due to the very high level of protection of sensitive data (eg, health data) under Article 9 of GDPR, access controls using biometric data are only permissible in exceptional cases (eg, restricted areas). Due to an obligation to monitor employees' working time in European countries, access controls are often linked to the beginning of employees' working time.²⁶⁹

B) VIDEO SURVEILLANCE

Monitoring employees at their workplace is not governed by European directives or other regulations, and the GDPR does not cover the subject explicitly. Article 23 of GDPR only provides for **hidden surveillance as a restriction of employees' rights**. This restriction is only permissible on the basis of a law. This establishes the validity of various national regulations for monitoring employees in Europe. One highly controversial discussed subcategory is video monitoring of employees.

Video monitoring is **generally permissible** in Belgium, France, Germany, Italy, Spain and the UK, but the individual requirements for permissibility differ greatly.

267 See n 264 above.

268 See www.humanresourcesmanager.de/arbeitsrecht/homeoffice-wie-viel-darf-der-arbeitgeber-kontrollieren/ (last accessed on 3 September 2024).

269 See www.lto.de/recht/hintergruende/h/eugh-c-5518-arbeitszeit-richtlinie-zeiterfassung-ueberstunden-arbeitnehmerschutz/ (last accessed on 3 September 2024).

Permissible video monitoring in France, Spain and the UK, for example, requires that employees have been informed in advance.²⁷⁰ Prior warning is not required in Belgium, Germany and Italy, since it could defeat the purpose of the action (eg, for detecting crimes).²⁷¹

However, the **requirements for justifying the action** are particularly strict in these countries. The employer must have a **legitimate interest** in the monitoring and the employer's legitimate interest must outweigh the employee's interests. This depends particularly on whether milder action is available that impinges less on the employee's general right to privacy.²⁷² In addition, predominantly private areas (eg, changing rooms or lunchrooms) are to be excluded from monitoring in Europe.

There are, however, different approaches as to **storage periods** for video monitoring. In Germany, legally filmed criminals are not worthy of protection, so data does not generally have to be deleted after a certain period. Otherwise, the nature of enforcing general personal/privacy rights would be changed for the sole purpose of protecting criminals from their responsibility for deliberate illegal action.²⁷³ In France, by contrast, there is a fixed deadline by law of one month for storing data from video monitoring.

Even the **participation of employee representatives** is handled differently. In many European countries, employee representative bodies must be involved in the monitoring process (eg, France, Germany and Italy), while in other countries participation is not required.²⁷⁴

c) COMMUNICATION MONITORING

There is also **no general regulation** on communication monitoring in European countries. Generally, the employer can prohibit the use of the internet for private purposes (eg, writing private emails during working hours). However, the employee representatives' consent is required for this in many EU Member States.²⁷⁵ The follow-up question is then whether employers may check the contents of the private communication and use them against employees for issuing formal warning letters or termination. It can generally be said that matters not expressly identified as 'private' are subject to monitoring by the employer and that misuse by employees may also be punished in any case where IT systems have been used privately when this has been prohibited.

270 See www.cms-lawnow.com/ealerts/2017/05/technology-at-the-workplace (last accessed on 3 September 2024).

271 See www.ihk.de/konstanz/recht-und-steuern/arbeitsrecht/bestehende-arbeitsverhaeltnisse/grenzen-videoueberwachung-1671792 (last accessed on 3 September 2024).

272 See n 270 above.

273 See www.datenschutz-notizen.de/bundesarbeitsgericht-kein-beweisverwertungsverbot-bei-zu-langer-speicherdauer-von-videoueberwachungsdaten-4121100/ (last accessed on 3 September 2024).

274 See n 270 above.

275 *Ibid.*

In any case, as mentioned above, employees' general personal rights must be considered. In 2017, the European Court of Human Rights considered a secret inspection of a company email inbox to be impermissible.²⁷⁶ The court pointed out that there is no European consensus on the monitoring of electronic correspondence in the workplace. Few Member States have established rules requiring that workers' private lives and correspondence be respected at the workplace. In monitoring employees' correspondence, proportionality and procedural safeguards against arbitrariness are essential. Regarding the **permissibility of the measure**, courts must consider:

- whether the worker has been informed of the possibility that the employer is applying surveillance measures to correspondence or other communication;
- the extent of the employer's surveillance and to what extent it intrudes into the worker's private life;
- whether the surveillance was temporary and how many people have access to the results;
- whether the employer has put forward legitimate reasons to justify monitoring the communication and examining its content; and
- whether it would have been possible to set up a monitoring system which interfered less with rights than the examination of the content of the worker's correspondence.²⁷⁷

3. *Working hours*

Most laws around the world relating to working hours were originally enacted for the **protection of employees' health** and intended to **prevent exploitation** by unscrupulous industrialists but are no longer suitable for the digital employees of the future trying to find the right work-life balance. Employees' personal responsibility includes not only organising their own tasks and workspace, but also organising their own working hours. Project work is increasing, and the disappearing lines separating different types of work make it impossible to monitor working hours precisely. The **trend of flexible working** hours is being implemented in the form of working from home, trust-based working hours, desk sharing, standby duties and variable working hours. To benefit from the advantages of digitalisation, employees and employers should not enter into specific agreements on the scheduling of working hours or – even better – should expressly agree on **flexible working hours**. The US Fair Labor Standards Act

²⁷⁶ See [https://hudoc.echr.coe.int/eng#{'itemid':\['001-177082'\]}](https://hudoc.echr.coe.int/eng#{'itemid':['001-177082']}) (last accessed on 3 September 2024).

²⁷⁷ *Ibid.*

(FLSA)²⁷⁸ might serve as a model for flexible management of working hours within digitalisation in other regions, but European law is very inflexible and strict.

A) AN OVERVIEW OF WORKING TIME LAW

To guarantee protection of workers' health, **guidelines for working time are necessary**. But how restrictive do these need to be to ensure effective health protection?

The FLSA requires that non-exempt employees be paid overtime at a rate of 1.5 times their regular rate of pay for each hour worked beyond 40 hours in a work week. However, there are no maximum daily work hours, rest periods or minimum paid holidays. Japan also generally has a 40-hour work week with eight hours of daily work. In practice, however, employees in Japan work significantly more than this. Almost eight per cent of Japanese full-time employees work an average of 60 or more hours per week.²⁷⁹ However, a recent law on work-life balance limits overtime to 15 hours per week.

The EU Working Time Directive²⁸⁰ stipulates a **maximum of 48 weekly working hours** on the basis of a six-day work week, which can be arranged flexibly by the workers as long as the requirements for an uninterrupted rest period of eleven hours between working days and 24 hours for recovery within a seven-day period are met. The maximum working hours can be increased to up to 60 per week through collective bargaining agreements or similar national agreements. The limit on working hours per week is often supplemented by national regulations that stipulate a maximum of eight to twelve working hours per day in exceptional cases.

Three issues have long been discussed in Europe. One of these is that the need for **daily maximum working hours** (in Germany as well as for certain people in France and Austria) in the digital age is debatable.

The second issue is **inflexible rest periods of 11 hours**. According to the EU Working Time Directive, if any brief activity interrupts the rest period, this period must be restarted. In the modern age in which social media is used both for professional and private matters, this provision is not feasible. Such restrictive provisions are no use to the parties to the employment contract if they do not comply with them. In some industries (eg, air transport, health care or public safety), special provisions apply in relation to maximum working hours and rest and break periods.

278 See www.dol.gov/agencies/whd/flsa (last accessed on 3 September 2024).

279 See www.statista.com/statistics/858359/japan-percentage-people-working-60-hours-or-more-per-week-by-age-gender/ (last accessed on 3 September 2024)

280 See <https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=CELEXper cent3A32003L0088> (last accessed on 3 September 2024).

But those rules are not the only guidelines: If the maximum of 48 working hours per week is exceeded (through a collective bargaining agreement or corresponding provision), the EU Working Time Directive stipulates a balancing period of four months to bring the average working hours per week down to 48. In contrast, the balancing period regarding reduced rest periods is just 14 days. Both provisions are too abstract and cannot achieve the purpose of project-based extra work in individual cases.

B) ANNUAL WORKING TIME TO ACHIEVE FLEXIBILITY

As an alternative to the usual weekly working hours (35–40 in Europe), the EU Working Time Directive allows for **annual working time** to be agreed in an employment contract. In such cases, the scheduling of working hours depends on the volume of work and seasonal deviations. Typical cases where annual working time is agreed include seasonal work in the agricultural or tourist industries, but also for executive employees or project workers. Irrespective of the specific month in which the work is performed, the employee receives a constant monthly remuneration based on their average working hours over 12 consecutive months. In France, it is possible to agree annual working time as long as employers provide a tracking form that workers can fill out under the employer's supervision to record their working hours, the employees' workload is compatible while adhering to the daily and weekly rest periods, and the employers discuss the employees' workload with them once a year.²⁸¹ A study by the French Ministry of Labour shows that almost one in two managerial employees has an annual working time agreement because of the need for a **high degree of autonomy** and independence in the performance of their work and the organisation of their schedule.²⁸²

It is also possible under this model for the annual working time to be covered in full in certain months, while a release from the obligation to work is agreed for other months.²⁸³ Problems can arise in this context in some countries due to the social security protection of employees during the period in which they are released from work. To keep track of annual working time, the parties must agree to a **working time account** to be settled within the calendar year. However, this creates the risk that the working time account either has a surplus or a deficit of hours at the end of a year. While a positive balance for the employee is generally settled through additional compensation from the employer, it is much more difficult for the employer to demand repayment of wages that have already been paid. Workers often do not have to balance out a deficit of hours if they are instructed by employers to distribute their working hours as they see fit; employers

281 See <https://lpa-ggv.de/informationsbriefe/deutsch-franzoesischer-informationsbrief-november-2016/>; Arbeitsgesetzbuch - Légifrance (legifrance.gouv.fr) (last accessed on 3 September 2024).

282 See <https://my-payroll-pro.com/resources/working-time-france/#:~:text=Underper cent20Frenchper cent20lawper cent2Cper cent20theper cent20maximum,timeper cent20isper cent2035per cent20consecutiveper cent20hours.> (last accessed on 3 September 2024).

283 Lindemann, 'Flexibilisierung der Arbeitszeit und ihre Grenzen' (2013) ArbRAktuell 561 f.

are thus responsible for deficits. Therefore, the uncertainty of this model does not detrimentally affect employees.

C) OPT-OUT MODELS TO ACHIEVE FLEXIBILITY

The best solution for ensuring workers' health and safety and for achieving flexibility in working hours would be an **opt-out clause from particular provisions** of working time law in an individual agreement. 'Opt-out' describes the option of employers and workers to deviate from working time provisions in an individual agreement.

According to the **Working Time Directive**,²⁸⁴ an opt-out from the maximum weekly working time is possible under certain conditions, such as if the express and free consent of the employee is given. As of 2017, 18 Member States provide for the use of the opt-out. Of these, six²⁸⁵ allow the use of the opt-out irrespective of sector, whereas the other 12²⁸⁶ limit its use to jobs which make extensive use of on-call time, such as health services or emergency services. Croatia and Austria are new users of the opt-out. The remaining ten Member States²⁸⁷ do not use the opt-out.²⁸⁸

D) EXCLUSION OF CERTAIN GROUPS OF WORKERS

Another way to introduce flexible working time models is not just to establish provisions that deviate from individual laws, but also to **define groups of workers who do not fall within the scope** of certain provisions of the Working Time Directive. In some European countries, for example, executive employees are not subject to national laws on working hours due to their insufficient need for protection. The EU Working Time Directive states that persons with **independent decision-making powers** without specific instruction in technical matters may be excluded from the scope of the restrictive rules.²⁸⁹ However, European Member States make different use of this group opt-out clause, as per the following examples.

In **Austria**,²⁹⁰ the following persons are excluded from the scope of application of the Austrian Working Hours Act pursuant to Section 1 (2) of the same: Executive

284 Art 22, Directive 2003/88/EC.

285 Bulgaria, Croatia, Cyprus, Estonia, Malta and the UK.

286 Belgium, the Czech Republic, France, Germany, Hungary, Latvia, the Netherlands, Austria, Poland, Slovakia, Slovenia and Spain.

287 Denmark, Ireland, Greece, Italy, Lithuania, Luxembourg, Portugal, Romania, Finland and Sweden.

288 See eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0254&rid=1 (last accessed on 3 September 2024).

289 Bissels and Krings, 'Dringend gebotene Reform des Arbeitszeitgesetzes – Neues wagen' (2016) NJW 3418 ff.

290 See www.hrweb.at/2018/12/neues-arbeitszeitgesetz-60-stunden-woche-gleitzeit-normalarbeitszeit-ueberstunden-oesterreich/ (last accessed on 3 September 2024).

employees or other employees **on whom significantly independent decision-making authority** is conferred **and whose total working hours are:**

- not recorded or defined in advance due to the special characteristics of the work; or
- can be decided by these employees themselves with regard to scheduling and duration.

In practical terms, this probably means that employees down to the third level of management are excluded. This amounts to approximately 11 per cent of Austrian employees.²⁹¹

In the **Netherlands**, employees who earn at least three times the statutory minimum wage plus a vacation allowance are excluded from the scope of the Dutch Working Hours Act. Currently, the exemption already applies to an **annual salary of around €75,000**. It is based solely on the amount of pay; there are no other requirements.²⁹²

The **Norwegian** Working Hours Act²⁹³ does not apply to managers and employees in particularly independent positions. Whether an employee has a particularly **independent position** must always be determined on a case-by-case basis. Furthermore, the Norwegian Working Hours Act has included the option of negotiating daily working hours individually since 2004. Employees are entitled to flexible working hours, provided that this is practicable without significant disadvantages for the company. The employment contract generally stipulates only a standard 37.5-hour week. It is up to the contracting parties to decide on how the working hours are to be distributed among the individual days, the beginning and the end of the working day, and the organisation of the workplace. **Whether there is a significant disadvantage for the company always must be decided on a case-by-case basis after weighing each party's interests.**

Under **French** law, executive employees ('*cadres*') are **employees who have the autonomy to decide on their working hours and organisation themselves** and whose type of work means that they are not bound to the normal working hours in the establishment (under collective agreements). Around 19 per cent of employees in France are *cadres*.²⁹⁴ They may work up to 218 days per year. There is therefore no limit on daily or weekly working hours for this group of persons, only an annual limit as to the number of days. This also applies to workers whose

291 See www.ots.at/presseaussendung/OTS_20190708_OTS0033/ak-fuehrungskraefte-monitor-trotz-hoher-arbeitsbelastungen-sind-die-chefs-in-oesterreich-zufriedener-als-ihre-mitarbeiter (last accessed on 3 September 2024).

292 See <https://wetten.overheid.nl/BWBR0007687/2018-11-14> (last accessed on 3 September 2024).

293 See www.nhond.no/en/business-in-norway/basic-labour-law/ (last accessed on 22 October 2024).

294 See www.insee.fr/fr/statistiques/4768237?sommaire=5014835#:~:text=19per cent2C3-,Lectureper cent20per cent3Aper cent20enper cent2019per cent2Cper cent2021per cent2C6per cent20per cent25per cent20desper cent20hommesper cent20en,cadresper cent20etper cent20professionsper cent20intellectuellesper cent20supper centC3per centA9rieures (last accessed on 3 September 2024).

working **hours cannot be specified in advance** and who can **organise their working time** for the performance of their assigned tasks **independently**.

In **Poland**, exact working hours do not have to be recorded for certain groups of employees, including CEOs, level managers and **staff working in a task-based working time system**. The task-based system is very popular among Polish employers, especially in the IT sector, because it allows for greater flexibility in an employee's work schedule. The task-based system focuses on tasks entrusted to the employee and the time it takes to complete them, rather than on exact time periods when the employee should be at the employer's disposal.²⁹⁵

In **Denmark**, a new law will come into force in July 2024, according to which a weekly limit of 48 working hours will apply by default. However, employees can **opt out** of this and choose a 60-hour limit. The assessment period for the maximum weekly working hours can be extended to up to 12 months – ie, the weekly average may not be higher during this period, but individual weeks may be. Most importantly, **self-organisers such as managers and employees whose workload is unpredictable** or depends on the needs of their customers are not obliged to record their working hours at all. The Danish approach permits self-motivated employees to establish their own boundaries, which may serve as a model for other countries.²⁹⁶

E) TIME RECORDING RULING AND IMPLEMENTATION

In 2019, the Court of Justice of the European Union (**CJEU**) ruled that EU Member States must require employers to set up an '**objective, reliable, and accessible system**' for **recording the daily working hours** of each worker. This decision aims to ensure compliance with the fundamental rights not to work beyond the maximum working hours, and to enjoy daily and weekly rest periods as outlined in Article 31 of the EU Charter of Fundamental Rights and the Working Time Directive. National lawmakers have discretion in implementing these systems, considering the specific characteristics of different sectors and enterprises.

The implementation of the CJEU ruling on mandatory working time recording varies from one EU Member State to another. Austria, Belgium, Croatia, the Czech Republic, Estonia, Finland, France, Hungary, Ireland, Latvia, Luxembourg, The Netherlands, Poland, Portugal, Romania, Slovakia and Slovenia **already had general regulations** on the mandatory recording of working time that complied with the CJEU ruling.

In **Spain**, the country of origin of the CJEU ruling, a law was passed in May 2019 that requires companies to implement a working time recording system. In June 2021,

295 See <https://apps.eurofound.europa.eu/legislationdb/working-time-flexibility/poland> (last accessed on 22 October 2024).

296 See <https://mklaw.dk/the-danish-parliament-has-adopted-new-rules-on-the-requirement-to-register-working-time/?lang=en> (last accessed on 3 September 2024).

Greece passed a new labour law that mandates the use of an electronic system for recording employees' time through digital work cards. In **Denmark**, a new law came into force in July 2024 that fully implements the CJEU ruling.

In **Germany**, there is no legal regulation on the systematic recording of all working time yet. The Working Hours Act only requires employers to document daily working hours in excess of eight hours. In September 2022, the German Federal Labour Court ruled that employers are already required to record all working hours.

The ruling has not yet been implemented in **Sweden and Italy**.

F) OPINION OF UNIONS AS TO FLEXIBLE WORKING HOURS

Both lawmakers and unions, however, consider increasing the flexibility of working hours to be **unilaterally advantageous for employers**. Unions mainly argue that the possibility of permanent availability will lead to employers having increased expectations of employees. According to a union study, a quarter of employees often must be accessible during their free time.²⁹⁷ This causes significant psychological stress. Not even half of employees are able to switch off from work. Digitalisation therefore does not automatically facilitate reconciling work and family life in their opinion.

In general, unions' (eg, the European Trade Union Confederation, or ETUC) positions regarding the Working Time Directive include demands to:²⁹⁸

- end the individual opt-out from the 48-hour limit on weekly working time;
- keep the current reference periods in place;
- codify the CJEU decision, especially regarding on-call time in the workplace;
- further limit derogations for autonomous workers; and
- confirm that the directive applies to all groups of workers.

In Germany (2021), 22 per cent of employees believe that they also must be available on their time off, at least to some extent. Only 13 per cent are regularly contacted outside of working hours, while the rest (87 per cent) are never or rarely contacted.²⁹⁹ Another critical point in the unions' point of view is the **increased number of unpaid overtime hours** due to working outside their office via

297 See www.dgb.de/presse/++co++24999bfc-c9dd-11e7-9da9-52540088cada (last accessed on 3 September 2024).

298 See www.etuc.org/en/issue/working-time (last accessed on 3 September 2024).

299 Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, Arbeitszeitreport Deutschland, www.baua.de/DE/Angebote/Publikationen/Berichte/F2507.html (last accessed on 3 September 2024).

mobile devices. So far, flexibility has tended to lead to an extension of actual working hours. In Germany for example, full-time employees work 43 hours.³⁰⁰

One point against the unions' positions is that **working conditions are getting better**. In European countries, the working time quality index – issued by Eurofound – has improved in recent years.³⁰¹ In particular, the number of employees with longer working weeks (over 48 hours a week) has declined to around ten per cent in central Europe.³⁰² The number of part-time employees reached its peak in 2013 at 19.1 per cent and has since been decreasing, reaching its lowest point so far of 17.9 per cent in 2023.³⁰³ The average number of **paid overtime** hours per employee per year in Germany has fallen by half from 30.8 per cent in 2000 to 14 per cent in 2022.³⁰⁴

G) NECESSARY CHANGES

AA) MAXIMUM WORKING HOURS

Zero-hour contractors combine elements of freelance work and full employment, common in the Netherlands where no fixed hours are set.³⁰⁵ Employers benefit from this model for on-call or project work, calling on workers as needed without permanent employment. Workers, in turn, are not required to accept work and can be unavailable when contacted. They are entitled to the statutory minimum wage and paid leave, and they can work for multiple employers, avoiding idle time.³⁰⁶ Zero-hour contracts, while lacking the full protections of permanent positions, provide more security than informal employment.³⁰⁷

300 See n 297 above; n 299 above.

301 See www.eurofound.europa.eu/publications/flagship-report/2021/working-conditions-and-sustainable-work-analysis-using-the-job-quality-framework (last accessed on 3 September 2024).

302 Download at www.eurofound.europa.eu/en/publications/2021/working-conditions-and-sustainable-work-analysis-using-job-quality-framework p 20 (last accessed on 22 October 2024).

303 See <https://de.statista.com/statistik/daten/studie/1098738/umfrage/anteil-der-teilzeitbeschaeftigung-in-den-eu-laendern/> (last accessed 3 September 2024); [https://today.westlaw.com/Document/Id6a7e6c4e84d11e398db8b09b4f043e0/View/FullText.html?originationContext=document&transitionType=DocumentItem&ppcid=9b377e11ba7e4b54a36e308744af3522&contextData=\(sc.Default\)](https://today.westlaw.com/Document/Id6a7e6c4e84d11e398db8b09b4f043e0/View/FullText.html?originationContext=document&transitionType=DocumentItem&ppcid=9b377e11ba7e4b54a36e308744af3522&contextData=(sc.Default)) (last accessed on 3 September 2024).

304 See [www.haufe.de/personal/hr-management/arbeitszeit-ueberstunden-in-deutschland_80_412324.html#:~:text=Dieper cent20statistikper cent20zeitper cent20dieper cent20Anzahl,undper cent2016per cent20C9per cent20unbezahlteper cent20per centC3per cent9Cberstunden](http://www.haufe.de/personal/hr-management/arbeitszeit-ueberstunden-in-deutschland_80_412324.html#:~:text=Dieper%20statistikper%20zeitper%20dieper%20Anzahl,undper%2016per%20C9per%20unbezahlteper%20per%20C3per%20Cberstunden) (last accessed 3 September 2024).

305 Dzida, 'Null-Stunden-Verträge: Wie weit darf die Flexibilisierung der Arbeitszeit gehen?' (2016) ArbRB 19 ff.; See <https://business.gov.nl/running-your-business/staff/recruiting-and-hiring-staff/hiring-on-call-employees-with-a-zero-hours-contract/> (last accessed on 3 September 2024).

306 See <https://business.gov.nl/running-your-business/staff/recruiting-and-hiring-staff/hiring-on-call-employees-with-a-zero-hours-contract/> (last accessed on 3 September 2024).

307 *Ibid.*

Zero-hour contracts, though often associated with less pay than permanent employment, offer significant flexibility for both companies and workers. Employers can address staff absences and manage heavy workloads without needing full-time positions. In other European countries, by contrast, restrictive employment laws lead to higher unemployment or agency work.³⁰⁸ Zero-hour contracts are generally prohibited elsewhere, with regulations requiring guaranteed minimum hours. These contracts help integrate untrained or older workers into the job market.³⁰⁹ However, the EU Directive on Transparent and Predictable Working Conditions mandates advance notice of work schedules.³¹⁰ In response, the Dutch government plans to replace zero-hour contracts with fixed basic contracts that specify minimum hours, while students can still work on-call.

BB) BREAKS AND REST PERIODS

If the EU Working Time Directive is taken literally, every **short period of work that interrupts the fixed rest period** of 11 hours would then **cause the rest period to start over**. For this reason, it would be impossible to work during the rest period after the end of the working day. Simply reading and writing an email on one's private smartphone or taking a phone call at home would interrupt the rest period. Even the use of social media channels, which could be for private or work purposes, would potentially be a violation of the law. Boundaries are disappearing here even faster than they are regarding working hours, and the gap between legislation and reality is increasing.

A general rule that every interruption of the rest period means that the rest period must start again is out of step with the current era of smartphones. It is difficult for lawmakers to define what a suitable or tolerable interruption would be, however. In legal commentary, periods of one, five, ten or 15 minutes are suggested as insignificant, but there can be no strict limits. An **interruption is supposed be relevant only if it is 'substantial'**.³¹¹ It is not lawmakers but the courts who must decide when this threshold is exceeded in the individual case. Another criterion could be whether the short interruption was expected by the employee or not.

308 See <http://www.theguardian.com/uk-news/2015/sep/02/number-of-workers-on-zero-hours-contracts-up-by-19> (last accessed on 3 September 2024).

309 Dzida, 'Scheinselbstständigkeit 4.0 – 'Die Uberisierung' verändert die Arbeitswelt' (7 October 2015) 232 *Frankfurter Allgemeine Zeitung* 16.

310 See <https://ec.europa.eu/social/main.jsp?langId=en&catId=1313> (last accessed on 3 September 2024).

311 See <https://euagenda.eu/upload/publications/untitled-218554-ea.pdf> (last accessed on 3 September 2024).

c) FLEXIBILITY AND BOUNDARIES BETWEEN FREE TIME AND WORKING TIME

Family working time allows both parents to reduce their working hours so that they can share their family duties. This model is useful both when raising children and when caring for close relatives. One of the advantages of this model from an economic perspective is that the model can encourage caregivers and parents, mothers in particular, to retain their jobs. The resulting losses in wages are supposed to be compensated for by payments from the state. Additionally, those workers are not required to adhere to the strict rest periods. In this regard, the EU Working Time Directive allows parents in individual cases to reduce the rest period to eight hours, but Member States must allow for this exception.

Irrespective of this, **part-time solutions** should always be agreed on only for a **fixed term, with a right to return to the former working hours**, because once employees have reduced their working hours, their employer has to find a replacement and needs to know when the employee will come back to their full-time job and be fully available again. This is why a legal right to return to the original working hours – similar to the right to return after maternity leave or parental leave – is being discussed in some European countries. The intention is for this to apply irrespective of the reason for the reduction of working hours.³¹²

h) CONCLUSION

It is characteristic of the new world of work not only that managers work independently and are granted a high degree of flexibility, but that many employees are integrated into projects or assessed on the basis of individual tasks and can therefore also benefit from the flexibility made possible by progressive technology. Younger employees are especially fascinated by technology and are willing to follow the **high speed of change of digital business models**. They feel at home in social media and actively use them for professional and private purposes. A different understanding of leadership and responsibility prevails here. Younger employees have less interest in companies and government authorities; their thoughts are oriented toward projects.³¹³ Young workers want to be independent and do not think much of traditional hierarchical company structures and fixed working hours. Whereas private life used to be organised around work, today **work must fit in with private life**.³¹⁴

312 See www.bmas.de/SharedDocs/Downloads/DE/Publikationen/a883-weissbuch.pdf?__blob=publicationFile&v=2 p 123 (last accessed on 3 September 2024).

313 See n 149 above.

314 *Ibid.*

Not only companies, but also employee representatives and national lawmakers are responsible, however. The main responsibility lies with European and national lawmakers, who must create a flexible and practical framework for work during digitalisation. To do this, one would have to initiate a revision of the EU Working Time Directive or make use of the freedom to deviate from it that is already being promoted in Member States.

III. Terminations due to LDT

Digitalisation poses the increased possibility of monitoring employees. It is easier for employers to compare their staff's performance levels using system data generated by AI or automation. This makes low performance easier to identify and puts employees under more pressure. However, European law in general does not expressly follow the US 'fruit of poisonous tree' doctrine, where the main question regarding **terminating low-performing employees** is whether the relevant data collection process was legally justified. Illegal collection of data can lead to a ban on the use of the evidence in court proceedings in the US.

Moreover, technology has advanced so much that some **work processes can be fully taken on by machines and robots** as described above. This raises the question as to whether redundancies are permissible if caused by labour-displacing technology (LDT). Unions are also warning that jobs are at risk, in some cases with respect to entire occupational fields, due to the great potential for savings.³¹⁵ It is therefore to be expected that courts will have to deal with **digitalisation-related redundancies** even more frequently.³¹⁶ In Europe, digitalisation-related redundancies are being treated as dismissals for operational reasons. European countries and especially labour courts are very strict regarding the permissibility of terminations resulting from restructuring to increase productivity. Employers must prove that the job has ceased to exist and that there is no other adequate employment option. In certain circumstances, however, employers are forced to offer reasonable training measures so that employees can constantly respond to the changing job description. If use can be made of such a further training option, redundancies cannot be justified.³¹⁷

315 See www.ki-wissens-und-weiterbildungszentrum.de/knowledge-pool/potenzielle-auswirkungen-von-ki-auf-arbeit-und-beschaffung/ (last accessed on 3 September 2024).

316 See www.heise.de/newsticker/meldung/Bundesarbeitsgericht-Digitalisierung-sorgt-fuer-mehr-Ueberwachung-im-Berufsleben-3627654.html (last accessed on 3 September 2024).

317 See www.spiegel.de/karriere/digitalisierung-wie-gut-deutsche-angestellte-vor-kuendigungen-geschuetzt-sind-a-1266898.html (last accessed on 3 September 2024).

G. NEW STRUCTURES IN COMPANIES

For economic reasons, many **jobs** will be performed by **intelligent software** or **machines** in the future. The main distinction made in this regard will not be between physical and cognitive work, but between routine and non-routine work.³¹⁸ Everything that is routine and does not correspond to the core competencies of the company will be **digitalised** or **outsourced**. This will be done in the future via platforms reaching hundreds of workers simultaneously. The **platforms** will replace the previous commercial outsourcing agents or other intermediaries, and reduce the number of coordinators within the company. Platforms enable companies and clients to make remote working easier than ever and be more agile with their organisational structures.³¹⁹ This consolidated outsourcing process will also lead to an altered corporate philosophy increasingly characterised by instructing external service providers instead of employing staff with the necessary skills (shared services).³²⁰

Companies whose focus to date has been less on IT and data processing must also adapt to technical innovations to stay competitive in the long run. Big data analyses, automated production processes, and preprogrammed decisions by intelligent algorithms are indispensable for bringing about a tangible increase in efficiency. Using alternative forms of work for the company (eg, virtual working groups, project groups, agile teams, scrums and crowdworking) means increasing efficiency.

Another change for companies is that employees no longer want to work for one company all their lives. Regular **job changes** are predictable when a project no longer meets the employee's needs or the employer's image no longer meets the employee's expectations. Employers should therefore structure future teams in a flat or horizontal manner and create **flatter hierarchical** levels in the company.³²¹ Organisations that work partially in cross-functional teams have seen a significant improvement in performance, for example by increasing efficiency and innovation.³²²

I. Work from anywhere, anytime with fewer hierarchy levels

As office rents rise and many employees prefer to work remotely anyway, companies are saving themselves the expense of renting office space for each employee. They are abandoning individual offices in favour of open offices ('**open space**'), in which workplaces are shared by employees ('**desk-sharing**').

318 See <https://files.stlouisfed.org/files/htdocs/conferences/annual/Jaimovich.pdf> p 7; <https://blog.iao.fraunhofer.de/schnelltest-hat-dein-job-genug-routine-fuer-kuenstliche-intelligenz/> (last accessed on 3 September 2024).

319 See n 165 above, 52.

320 Moussavian, 'Work 4.0 – Megatrends Digital Work of the Future – 25 Theses', 86.

321 See n 238 above, 18.

322 See www.deloittedigital.at/funktionsubergreifende-teams/ (last accessed on 3 September 2024).

Workplaces are no longer assigned to individual employees but can be booked as required or assigned according to the principle of 'first-come-first-served'. Open-space facilities typically feature retreat rooms for meetings, longer telephone calls or video conferences. Employees can access the company's internal network with their personal notebook using docking stations. However, new employment contracts and generally binding desk-sharing instructions should be limited to those employees who can work on the move. To prevent conflicts, lead times can be defined for bookings in the workplace or the retreat area, as well as handover obligations when a booking at the workplace finishes ('**clean desk**').

Another concept is **remote work**, where individuals work from outside the office. When entire teams or organisations work from different locations, it is called **distributed work**. In addition to the workplace and home, there is a growing trend to use '**third places**' as workspaces. These places, which are distinct from professional and personal spheres, are sometimes self-selected, such as cafes, libraries and lounges, and sometimes designated by employers, such as coworking spaces. In the future, we will need to adopt a **pluricentric perspective** on the work environment, moving beyond the rigid dichotomy of working from home or in a traditional office. Instead, the focus will be on integrating appropriate locations within a network or ecosystem based on the nature of the work.³²³

In 2019, before the Covid-19 pandemic, the **proportion of partial remote working** – ie, sometimes working from home – was just seven per cent of total working hours, but it has quadrupled in the meantime and now stands at **28 per cent** (2023). Many employees were positively surprised by the practicality of working from home, and these positive surprises led to a large and permanent shift in that direction. Self-employed and gig workers are three times more likely to be fully remote than employees. There are major differences between the individual sectors: in the IT sector, remote working is five times more prevalent than in the hospitality industry. In addition, twice as many people work remotely in cities than in the countryside.

However, it is not just the rooms where people work that are changing. Employees' attitudes are also changing. An analogue mindset is the reason why most companies fail to introduce modern company forms.³²⁴

Over the coming years, agile methods for and increased flexibility in reacting to digital trends will have the advantage over static business plans with fixed budgets.

323 Breuer and Kienbaum, 'Arbeiten ist kein Ort zum Hingehen mehr – Wie durch die Ablösung vom Büro als Arbeitsort Chancen für die Entwicklung unserer Gesellschaft und Städte entstehen' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023), 57.

324 See www.handelsblatt.com/unternehmen/management/job-agiles-arbeiten-flache-hierarchien-offene-bueroraume-die-new-work-illusion/24896462.html?ticket=ST-47350584-oODXD3lg3h4gjo3LUEcb-ap6 (last accessed on 3 September 2024).

To set up **agile work**, new internal methods are necessary. Some of these **trends** include:³²⁵

- abolishing a culture of presence and promoting a culture of results;
- sharing desks and creating an open-minded discussion area to bundle innovations;
- allowing for mistakes;
- breaking the big picture down into individual problems; and
- focusing on service and actively involving customers – reliable short-term results and employee satisfaction are not mutually exclusive.

Flat hierarchy levels are necessary to react quickly to trends, because the first developer is going to make the biggest gains in a fast-paced market. Digital transformation is not only causing job losses in back office and production, but also radical downsizing in middle management of major companies.

II. Remote work on the rise: benefits and challenges

Digitalisation has enabled remote working, which has **revolutionised the traditional workplace** by allowing employees to perform their duties from locations **outside of the traditional office** environment. This practice has gained significant traction in recent years, facilitated by advances in technology and changing attitudes toward **workplace flexibility**. As the world becomes increasingly connected and online, remote work has become a key component of **modern employment strategies**, offering numerous opportunities and benefits to both employers and employees. However, along with its benefits, remote work presents a unique set of challenges that both organisations and employees need to address.

1. *Overview of the benefits of remote work from the parties' perspectives*

Some of the benefits of remote work highlighted by employers include the following points:³²⁶

- flexibility for employees;
- compatibility of career and family;

325 See www.luther-lawfirm.com/fileadmin/user_upload/PDF/Broschueren/Studien/Studie_Agile_Arbeit_2019.pdf, 8 (last accessed on 3 September 2024).

326 See <https://doku.iab.de/kurzber/2019/kb1119.pdf> (last accessed on 3 September 2024); Wieduckel and Bellmann, 'Homeoffice: Perspektiven, Herausforderungen, Lösungsansätze' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 49.

- availability of employees (eg, during a business trip);
- increase in employee productivity;
- shorter travel times;
- increase in employer attractiveness;
- a quieter place to work;
- optimisation of office space utilisation; and
- expanded candidate pool due to lack of location ties.³²⁷

In particular, employees cite the following benefits, some of which overlap with those cited by employers:³²⁸

- better job performance;
- shorter travel times;
- compatibility of career and family; and
- possibility of longer working hours.

2. *Overview of the challenges of remote work from the parties' perspectives*

Employers cite the following barriers to remote work:³²⁹

- the nature of the specific job does not allow remote work;
- difficulties in collaborating with colleagues;
- privacy concerns;
- difficulty with supervision/monitoring; and
- lack of technical requirements.

Some of the challenges of remote work highlighted by employees include the following points:³³⁰

327 Knappertsbusch and Stute, 'Homeoffice: Perspektiven, Herausforderungen, Lösungsansätze' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 89.

328 See n 326 above.

329 *Ibid.*

330 *Ibid.*

- the nature of the specific job does not allow remote work;
- difficulties in collaborating with colleagues;
- continued expectation from managers to be present in the office;
- separation of work and private life;
- difficulty meeting technical requirements; and
- prohibition on remote work despite being technically feasible.

3. *Addressing remote work challenges*

Addressing these challenges and issues typically involves **adhering to three guiding principles** for organising remote work: **voluntariness, participation and balance**.³³¹ In practice, and according to a wide range of research, it is undisputed that voluntariness is a crucial prerequisite for **job satisfaction**, commitment, high productivity and good quality in work.³³² Therefore, remote work arrangements should take voluntariness into account. In addition to voluntariness, **employee participation** requires that employees **have a say in terms of flexibility**, accessibility, goals and performance expectations. This influence ensures that the potential for autonomy and flexibility that remote working can offer is actually realised. This requires **clear rules on employee participation rights**. These participation rights should be embedded in collective bargaining agreements and company agreements, and not exist independently of them. The **principle of balance** aims to address the issue of separating work and personal life by establishing a clear **distinction between work hours and other aspects of life**, and by incorporating periods of relaxation into the time structure of remote work.³³³

Remote work management highlights the need for a management approach that is tailored to the specific information, communication and support needs of individual employees. These needs are determined by the **interaction of complex situational factors** affecting the individual employee, such as life circumstances, experience in digital work environments and the nature of the job. Therefore, leaders need a high degree of perceptual competence and specialised knowledge about the necessary distinctions in interaction, feedback and intervention. This requires support to be provided to leaders through training programmes or similar initiatives where they can learn the specific demands of remote leadership.³³⁴

331 See n 327 above, 49.

332 See www.boeckler.de/pdf/p_wsi_report_65_2021.pdf (last accessed on 3 September 2024); n 327 above, 49.

333 See n 327 above.

334 *Ibid.*

4. Alienation or bonding through remote work?

Remote working naturally creates distance between employers and employees, as well as among employees themselves. It is less common for staff to meet in the hallway or have lunch together. Team meetings are mostly online. If not managed consciously, this **natural distance** can lead to **alienation** and ultimately **less loyalty** to the employer. Without a presence in the office, employees may feel **disconnected** from the organisation's culture and mission. In addition, the lack of face-to-face interactions can hinder the **development of strong bonds** with coworkers and supervisors, further exacerbating feelings of isolation and disengagement from work and the organisation as a whole.

This interpretation is supported by a survey which showed that 53 per cent of those who worked exclusively from home planned to leave the company within the 12-month period of the survey. For those who came into the office occasionally, the figure was only 47 per cent. For those who did not work from home at all, the figure was only 43 per cent.³³⁵

Nonetheless, employees increasingly **want to work remotely**. An employer's ability to offer remote work plays an important role in the selection of new employees and the retention of existing employees. A **blanket rejection** of remote work can therefore become a **disadvantage** in the war for talent and negatively impact **employee loyalty**.

Employers face a **dilemma**. On the one hand, remote working can lead to employee alienation and reduced loyalty. On the other hand, employees increasingly want to work remotely and are choosing potential employers accordingly. To counteract the gradual alienation experienced in remote work environments, a renewed commitment from leadership is required. Establishing a more **agile and networked organisation** requires greater clarity and stronger guidelines to prevent the organisation from succumbing to overload. Increased management commitment requires strong leaders who can lead by example and are clear about their goals. Employees need to be able to work **independently**, but they also need to feel **socially integrated**, regardless of where they work.

A) COMMUNICATION AS A UNIFYING FACTOR

One way to prevent alienation is to create or **maintain dynamic communication** despite digital channels. The following rules can be used as a starting point.³³⁶

- **Regular communication:** Establishing a regular communication routine provides structure and ensures a smooth flow of information within the

³³⁵ See www.wiwo.de/erfolg/beruf/ende-der-homeofficepflicht-das-gerede-von-der-rueckkehr-zur-normalitaet-ist-absurd/28176836.html (last accessed 3 September 2024).

³³⁶ See www.commma.de/schleichende-entfremdung-die-gefaehrliche-seite-des-online-arbeitens (last accessed on 3 September 2024).

team. One possible consistent starting point for meetings could be a **'check-in' process**, where each participant briefly shares their current state of mind at the beginning of the meeting. This allows participants to settle into the meeting and align themselves with the agenda. It also helps people get to know each other better and builds **team cohesion**.

- **1:1 calls:** To provide more space for interaction than is possible in a team call, 1:1 video calls can be scheduled with each employee to receive direct updates. These regular 'updates' primarily **convey interest in and appreciation for** the employees. It is crucial to prioritise the consistent attendance of these meetings and ensure they are manageable for the leader's schedule.
- **Rich communication channels:** Without gestures, nuances of tone or overall body posture, it is difficult to emotionally categorise what you hear. For this reason, you should always use the richest communication channel possible in the current situation. That means preferring phone calls over emails, video calls over phone calls, and face-to-face meetings over video calls.
- **Informal team activities:** Another way to counteract alienation is through team activities outside of the regular business routine. These activities can take place either **in person or online**, as there are now countless opportunities for team interaction and fun in digital spaces. Examples of successful online events include digital escape rooms, interactive online games, remote team celebrations fuelled by creative contributions from individuals, or even just a digital after-work beer.

B) ALTERNATING REMOTE WORK

In Germany, 39 per cent of all office workers spend every working day in the office, although 65 per cent would prefer a **hybrid solution** where they could work from home some days. Only ten per cent would like to work from home all week.³³⁷ It is therefore crucial to find a **balance between remote work and in-office work** that suits the interests of the company and the wishes of the employee.

5. *Remote work: risk of offshoring*

During the Covid-19 pandemic, those who were able to work remotely found themselves in a better position than most others. While cooks, salespeople and cleaners were unable to do their jobs, office workers, IT specialists and lecturers

³³⁷ See <https://news.cbre.de/65-prozent-der-bueroarbeiter-wuenschen-sich-kombination-aus-buero-und-homeoffice/> (last accessed on 3 September 2024).

were able to continue working for the most part. According to a study by the University of Basel, this could be **reversed in the future**. The study calculated the potential for various activities to be performed remotely in the future. The thesis was that activities with a high remote potential would increasingly come under pressure from offshoring.³³⁸

The reason is obvious. If the employer recognises that activities can be adequately performed remotely, it should generally be possible to do so in **low-cost peripheral regions or abroad**. This can save on expensive office space and reduce wage costs. It also greatly expands the candidate pool.

This shows that while remote work has many benefits for employees, it also has risks. The **winners of recent years** could become the **losers in the future** as remote work increases. Employees who perform work that cannot be done remotely, on the other hand, could be better protected from offshoring.³³⁹

6. *Productivity in remote work environments*

A critical issue in evaluating remote work is **employee productivity**. There is no clear answer to the question of whether productivity **increases or decreases** when working remotely.

On the one hand, there are employers and employees who claim that **productivity is decreasing**. Common explanations include lack of control, distractions from the home environment, and the fact that electronic communication has been shown to require more effort than face-to-face meetings. Some of this is supported by research. For example, a team from the US Federal Reserve found that call centre workers experienced a **decrease in productivity** when they switched to working from home. Employees showed a three per cent drop in performance. One of the key points is that employees working from home may not be able to seek advice as quickly as they could in the office when problems arise.³⁴⁰

On the other hand, some employers and employees have seen **productivity gains**. A common explanation is that remote work increases job satisfaction and creates a more peaceful environment, which translates into higher productivity. Some research supports this view. For example, a Stanford study of 16,000 workers over a nine-month period found that remote work led to a 13 per cent **increase in productivity**. This increase in performance was attributed to a quieter

338 See <https://unibaswwzfaculty.blog/2020/06/11/heute-homeoffice-morgen-offshoring/> (last accessed on 3 September 2024).

339 See <https://unibaswwzfaculty.blog/2020/06/11/heute-homeoffice-morgen-offshoring/> (last accessed on 3 September 2024); www.nzz.ch/meinung/angestellten-im-home-office-droht-das-dicke-ende-ld.1600248 (last accessed on 3 September 2024).

340 Download at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4466130 (last accessed on 3 September 2024).

and more comfortable work environment, resulting in more calls per minute and more minutes worked per shift due to fewer breaks and sick days.³⁴¹

It should be noted that productivity when working remotely depends more on the individual case. Teamwork is hindered by remote work, while working from home is ideal for concentrated work hours. The elimination of commuting time also increases productivity. However, working from home poses problems for inexperienced and new employees. Successful onboarding depends on face-to-face interaction. The success of working from home also depends on the personality of the individual. Extroverts, who prefer interpersonal interaction, tend to have a difficult time working from home. Introverts enjoy the peace and quiet and lack of social pressure.

III. Remuneration structures

There are many **different types of variable remuneration** that are increasingly being considered not only for executive staff and sales representatives, but also for normal employees, making up an ever-greater share of overall remuneration.

For the average employee, salaries are calculated based on the number of hours worked. Working hours are still predominantly considered to be the amount of time for which the employee is present. The increasing breakdown of boundaries in terms of place of work and working hours, as well as employees' and project teams' self-determination, make it difficult for employers to check how many hours employees working using digital means have actually worked unless they use technical monitoring equipment such as webcams or keyloggers, which are prohibited at least in most European countries. The classic point of reference for the time wage system is absent, which means that it is being used less and less as a point of reference for remuneration ('pay for results').

Another new approach is to give workers the **choice of how high their salaries should be**. This requires a self-assessment of the employee's own value for the company. This involves gathering information about what competitors are paying elsewhere for roles similar to their own, how much colleagues with a similar role get, how much the company can afford to pay, and how much the company has grown due to the individual's performance. This compensation model automatically forces all employees to **reflect on their own work**, deal with budget issues and consider how much money they can justify to their colleagues. The model usually increases employee motivation, as salaries are open and accessible, and every employee wants to prove his or her worth. Increased transparency means that neither discriminatory nor secret wage agreements are possible.

In addition, the old 'job-for-life' model will no longer meet the needs of the more flexible Generations Y and Z, who **increasingly think of their own needs first**.

341 See www.gsb.stanford.edu/faculty-research/working-papers/does-working-home-work-evidence-chinese-experiment (last accessed on 22 October 2024).

Varied tasks, further training, flexible forms of work and cooperation, and flexible and attractive remuneration are necessary to prevent employees, in particular highly qualified ones, from changing jobs frequently. During negotiations, they will focus not only on good basic salaries, but on expanding their skills, innovative working time including a good work-life balance, remote working, and flexible leave and remuneration models. Employees will also demand additional payments in kind, instead of raises, as part of their salary.

'**Job hopping**' and '**cherry picking**' by individual employees or freelancers will also become an even greater challenge for HR to overcome, since the number of well-qualified applicants is declining, while the costs for assessment centres are rising. For this reason, particular attention should be paid to the cultural fit when selecting personnel. An agreeable corporate climate and a positive image of the employer make it difficult for employees who are potentially inclined to change employers.

Long-term staff motivation – and thus the preservation of in-house know-how – should be ensured through monetary incentive systems in addition to an appropriate working atmosphere. As an alternative to higher remuneration, a **work-life balance model** (eg, annual working time accounts) should be offered, since more and more employees are opting for more free time rather than for more money.

IV. Empowerment of employees

Employee empowerment is emerging as a cornerstone of the future of work. **Agile working** practices are fostering an environment where individual workers have **greater autonomy** and decision-making power. In addition, the focus is shifting to evaluating **work outcomes** rather than just hours logged. This paradigm shift not only redefines productivity, but also fosters a culture of trust and accountability within organisations.

1. Agile work

Agile work has become increasingly central to HR discussions,³⁴² signalling a dynamic evolution in contemporary work practices. It originated in software development, revolving around **task-centric project teams**, and has since expanded across industries due to the growing impact of digitalisation. This approach encompasses various forms of **flexible collaboration**, with a particular focus on flexible work schedules, diverse workplaces, and organisational structures that emphasise **minimal hierarchy**.³⁴³ This shift is driven by the need to adapt to

342 See www.hays.de/documents/10192/118775/hays-studie-hr-report-2018.pdf (last accessed on 3 September 2024).

343 Kania, Küttner *Personalhandbuch* (30th edn, CH Beck, 2023); Kannen, 'Agiles Arbeiten' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 177.

shorter product and innovation cycles, to which traditional, rigid hierarchies and organisational layers have difficulty responding in a timely manner. To meet this challenge, agile work breaks down traditional departments and introduces **self-organising teams** formed specifically for individual projects. These teams are structured to operate autonomously, overcoming the limitations of traditional setups (eg, requirement to follow instructions, work time or workflow).³⁴⁴ These teams are also referred to as **cross-functional teams**. These teams are set up for **specific projects** and consist of a project leader, who has a purely organisational role, and experts from various departments within the company. Throughout the duration of the project, these experts work exclusively on the project, free from other tasks or responsibilities.³⁴⁵ In agile work, the role of leaders shifts from directive to facilitator, organiser and budget holder.³⁴⁶ Instead of defining every single detail, the employer merely sets the framework conditions. The **individual employee**, on the other hand, becomes the focus and is transformed from an executor into a **creator**.

A) SCRUM: AN AGILE WORKING METHODOLOGY

The importance of **scrum**, a facet of agile work within product development, is continuing to grow. Originally limited to software development, it now encompasses all task-oriented project work. Scrum teams typically have three roles: **a product owner, a scrum master** and a **development team**. The product owner defines the product requirements, while the development team executes these requirements within the scrum framework, consisting of individual sprints of two to four weeks, working autonomously. At the end of each sprint there is a review where the development team presents the results to the product owner. The role of the scrum master is to **facilitate** the scrum process and individual sprints. As a team coach, they are responsible for ensuring that the project runs smoothly, without issuing directives.³⁴⁷

B) BENEFITS OF AGILE WORK

In contrast to traditional work structures, agile work is planned at the most **general level** possible at the beginning, and the level of detail is increased only as needed and as progress is made. The goal is to plan in detail only what can actually be estimated, resulting in **iterative, short-term planning** that is highly **responsive and adaptable**. Innovation thrives in agile environments

344 *Ibid.*

345 Half, 'Kross-funktionale Expertenteams – Wie gemischte ad-hoc Teams Projekte und Produktentwicklung im digitalen Arbeitsumfeld meistern' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 221.

346 Kania, Küttner *Personalhandbuch* (30th edn, CH Beck, 2023).

347 Thüsing and Mantsch, 'SCRUM als selbständige Arbeit: Administrative Regulierung versus gesetzgeberischer Wille?' (2023) NZS 841 f.

by leveraging cross-functional teams. Moreover, this collaborative approach integrates diverse perspectives from different departments, effectively **reducing organisational myopia**.³⁴⁸ In addition, agile work empowers individuals by giving them greater autonomy and accountability, fostering greater identification and engagement with their roles. Increased employee job satisfaction leads to higher productivity and quality of work, ultimately **increasing an organisation's competitiveness and profitability**.³⁴⁹

c) CHALLENGES OF AGILE WORK

The **rigid requirements of working time laws** also apply to employees who work in an agile manner. Even systems such as time accounts and trust-based working hours cannot generally offer extended flexibility. Especially in the final phase of a project, such as in a **scrum sprint**, it can be challenging to adhere to the maximum daily working time of ten hours and the 11-hour rest periods due to looming deadlines.³⁵⁰

In addition, the introduction of agile working can have a significant impact on the ability to **terminate employment for operational reasons**. Adaptable job scopes can make it more difficult to prove that further employment opportunities are unavailable.

Agile working environments often involve **external contributors** alongside employees. Often, both parties prefer a **freelance relationship** to a formal employment contract. However, this is only possible if the worker is largely free from instructions and not integrated into the operation. While freedom from directives is typically maintained in agile work, the **close collaboration** within a project often implies a degree of integration. This integration can pose risks such as **false self-employment** or **disguised temporary work arrangements**.³⁵¹

d) ADDRESSING AGILE WORK CHALLENGES

To avoid external workers being classified as employees, a **clear operational demarcation** is necessary.³⁵² When it comes to operational co-determination, it is advisable to involve the works council with as much transparency and as early as possible, ideally in the planning phase, and to fully respect its participation rights. In this way, the company's stakeholders can shape the change to an agile work organisation in a legally sound manner. To avoid potential disputes, it can also be

348 See www.iese.fraunhofer.de/blog/agilitaet-in-der-verwaltung-teil2/ (last accessed on 3 September 2024).

349 Kannen, 'Agiles Arbeiten' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 177.

350 Kannen, 'Agiles Arbeiten' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 177.

351 Pletke/Schrader/Siebert/Thoms/Klagges/Teubert, *Rechtshandbuch Flexible Arbeit* (2nd ed, CH Beck, 2022), B. margin no. 999.

352 *Ibid.*

useful to conclude a **framework agreement**. This agreement can cover relevant topics such as the definition of transfers, group work or qualification issues. In addition, the introduction of working time regulations could be a legally sound approach to ensure legal certainty and to react immediately to work peaks, eg, in the case of scrum sprints.³⁵³

2. *Leading by KPIs instead of micromanaging*

Reducing micromanagement is closely related to agile working. Micromanagement refers to a management style characterised by excessive control, close supervision and involvement in the minutiae of employees' tasks.

Some disadvantages of micromanagement³⁵⁴ include the following:

- constant micromanagement creates a **dependency on constant control**, which can lead to a loss of managerial control and a disconnect with employees;
- prolonged micromanagement fosters **dependency on constant managerial validation and guidance**, which inhibits employees' ability to work independently and drains managerial resources; and
- micromanagement **erodes trust** within teams, resulting in employees viewing their managers as overly controlling figures rather than approachable leaders.

One way to avoid micromanagement is to establish **key performance indicators (KPIs)**. Key performance indicators are basic metrics for business operations that allow companies to monitor progress toward their goals without managers having to oversee every action their teams take. Certain KPIs – such as revenue, monthly recurring revenue (MRR), customer acquisition rate and new recurring revenue – are critical to identifying organisational strengths and weaknesses. They also facilitate performance optimisation by establishing and tracking customised metrics. KPIs are quantifiable, making it easier for organisations to measure progress. They **highlight underperforming areas**, enabling executives to address root causes and develop improved **growth strategies**. Real-time tracking and monitoring of KPIs provides transparent insight into business performance, team productivity and progress toward goals. This methodology outlines necessary adjustments, changes and achievements within strategies **without resorting to micromanagement**.

353 See n 350 above.

354 See <https://aspirekc.com/why-kpis-matter-a-look-into-micromanagement-and-better-options/#:~:text=KPIsper cent2Cper cent20orper cent20keyper cent20performanceper cent20indicators,everper cent20moveper cent20theirper cent20teamsper cent20make>. (last accessed on 3 September 2024).

Tracking KPIs can foster greater collaboration among team members. When teams are empowered to interpret KPI results independently, they can **proactively explore new opportunities** and identify areas for improvement. Engaging your teams in KPI tracking fosters **teamwork** and cultivates innovative ideas that ultimately benefit the business in the long run.³⁵⁵

V. Changes in Working Environment of Employees due to AI and Robotics

I. Robots and AI as coworkers

'Dirty, dull and dangerous tasks' are almost exclusively carried out by robots today.³⁵⁶ In the industrial sector, intelligent machines are taking over more and more tasks from employees or working hand in hand with them as '**cobots**'. This may be only a further development of the assembly line and a process that has already existed for decades, but machines are now acquiring abilities that they can use to master even more complex activities thanks to their interconnection and swarm intelligence. The number of existing robots is also increasing. The average growth in **robot adaptation** has been 11 per cent per year. The number of industrial robots in particular grew from 2.1 million in 2017 to 3.5 million in 2021.³⁵⁷

Individual production is now also possible. There is an increasing development toward ever **closer interaction between humans and machines** (cyber-crews, digital twins, and even the integration of smart machines into the human body in the form of computer-brain interfaces or 'cyborgs').³⁵⁸ Similar developments can be seen across the AI white-collar realm. Well-aligned teams of AI systems and human professionals perform better in some domains than humans or machines separately.³⁵⁹

However, **intelligent algorithms** also **facilitate daily work** of people in offices. Tools can already draft contracts. Automated knowledge and document management systems already exist and due to cloud technology, data is available almost all over the world. Automatic payment processing and data transfer software is also facilitating back-office work.³⁶⁰ Rationalisation processes in the staff structure are therefore becoming ever more frequent in back-office tasks; thanks to intelligent algorithms, fewer and fewer materials and manual processes

355 *Ibid.*

356 Martini and Botta, 'Iron Man am Arbeitsplatz? – Exoskelette zwischen Effizienzstreben, Daten- und Gesundheitsschutz' (2018), *Neue Zeitschrift für Arbeitsrecht*, 625 ff.

357 See https://ifr.org/downloads/press2018/2022_WVR_extended_version.pdf, 10 f. (last accessed on 3 September 2024).

358 See n 356 above.

359 See <https://data.europa.eu/doi/10.2777/531856> (last accessed on 3 September 2024).

360 See <https://cms.law.de/DEU/News-Information/Digital-Economy-Recht> (last accessed on 3 September 2024).

are necessary (**'dematerialisation'**) to perform the economic function of the service (**'doing more with less'**).³⁶¹ It is thus no longer necessary to enter data manually, then print and file everything if the intelligent algorithm transfers the data independently, files them digitally and processes them automatically. This entails a great loss of jobs in major companies, especially banks and insurance providers in the back-office area.³⁶²

An important element of building positive working relationships with intelligent machines is to focus on fostering **trust in algorithms** by involving professionals and employees in the development of the algorithms. Global retailer H&M, for example, has focused on involving people in the development process to both change culture and improve adoption of AI across the organisation.³⁶³

2. *AI as a supervisor*

Since humans are increasingly performing various tasks under their own responsibility, the control function of supervisors is fading into the background. In the field of **intelligent production**, intelligent algorithms control the precisely timed production and thus take over monitoring of the employees' performance. In the process, intelligent algorithms are able to give the employees more detailed instructions and allocate more detailed tasks than human supervisors could.³⁶⁴ In the service sector, it is also conceivable that an algorithm can make decisions and specify work steps. As long as no detrimental decision regarding the employees' future is taken, robotic supervisors are permissible under labour, employment and data protection law. Managers can also delegate their right to give instructions to an intelligent system in general. However, the one **who delegates power is responsible for monitoring it**.³⁶⁵ That is to say that if the machine controls human workers on the one hand, a human being is required to control the machine on the other hand. However, the main challenge still concerns how to prevent AI from discriminating against people.

Further **legal limits** on the delegation of decisions may follow from company law. Significant business for the company must be done by the board of directors or the CEO, so that one or more natural persons continue to bear responsibility for a company.³⁶⁶

361 See <http://www.inztitut.de/blog/glossar/dematerialisierung/> (last accessed on 3 September 2024).

362 See www.noz.de/deutschland-welt/wirtschaft/artikel/1548121/bedroht-digitalisierung-bank-jobs (last accessed on 3 September 2024).

363 See www2.deloitte.com/content/dam/Deloitte/us/Documents/deloitte-analytics/us-ai-institute-state-of-ai-fifth-edition.pdf (last accessed on 3 September 2024).

364 Günther and Böglmüller, 'Digital Leadership – Mitarbeiterführung in der Arbeitswelt 4.0' (2017) 546 ff. See <https://start.docuware.com/blog/document-management/leadership-4.0-be-an-effective-digital-leader> (last accessed on 3 September 2024).

365 Weber, Kiefner and Jobst, 'Künstliche Intelligenz und Unternehmensführung' (2018) NZG 1131 ff.

366 *Ibid.*

3. *Changing role of managers*

The **role of managers** is changing from one where they ‘tell you what to do’ to one as a motivator, moderator and organiser. Not all managers measure up to this new definition of their role, so training should be considered at this level.³⁶⁷ Decisions are often predetermined by intelligent algorithms, meaning that managers have a 44 per cent chance of being partly replaced through automation.³⁶⁸ Another factor is that individual employees are working at their own pace more than ever before. The increased recourse to freelancers and the coordination of virtual teams operating internationally, often in different time zones, presents an additional challenge to managers. The role of humans, both normal employees and managers, is certain to change over the coming years.

A) NEW TASKS FOR MANAGERS

Managers’ tasks will change as described below:

- fewer repetitive, routine tasks in everyday life;
- fewer monitoring tasks – these will be performed by the system (eg, compliance system);
- increase in the team’s efficiency due to digital skill set;
- transfer and allocation of tasks to employees made possible through AI allowing them to work in a more self-directed and project-oriented manner;
- global networking of staff and thus of managers;
- social skills for networking to become more important than professional knowledge, which means that networking will become even more important than before;
- increasingly complicated interdependence of (project) staff members, making coordination more difficult;
- right to issue directives even in matrix structures;
- individual working hours of the staff members;
- different places of work to be considered;
- different time zones among team members; and

³⁶⁷ See www.ibm.com/blogs/ibm-training/reskilling-for-robots-ai-and-the-future-of-jobs/ (last accessed on 3 September 2024).

³⁶⁸ See n 21 above.

- need for employees of customers and external third parties to be involved in the project, while preventing them from being integrated into the company structures (de facto employee status).

B) ALGORITHMS AS DECISION-MAKING ASSISTANTS

In terms of **decision-making**, AI has three essential advantages over human decision-makers:³⁶⁹

- AI is capable of summarising facts, relating them to other facts and analysing them autonomously;
- AI can carry out extensive data analyses and predict the scenario that best suits the company based on prior knowledge; and
- AI does not base its particular decisions for or against something on certain prejudices or gut feelings and thus makes more rational decisions.

AI makes more **fact-based and comprehensible decisions** than humans in this respect. Furthermore, AI can find out the opinions, fears or desires of those affected by the decision with the help of data analyses and thus predict the greater acceptance of one or another corporate policy decision. These factors make decision-making much easier since a manual analysis would take a very long time.³⁷⁰

From a legal point of view, data privacy regulations oppose the use of AI for decision-making in the broadest sense. The EU GDPR generally prohibits scoring and automated decision-making. This prohibition is to be understood to apply only to decisions that are **detrimental to the concerned parties**, however.³⁷¹ In other words, decisions only need to be justified and accounted for by humans if they would refuse someone a privilege. It is legally possible, by contrast, to make positive decisions automatically or make the employees' obligation to work more specific automatically.

The prohibition of the GDPR is **not violated** if a decision that is positive for the employee is made or an applicant is rejected because certain **formal requirements have not been complied** with. An automatic rejection by a chatbot is therefore permissible if necessary qualifications (eg, a degree) are not met, since there is no 'assessment' of the employee in this case. The requirement is also not breached if the HR manager decides not to invite an applicant based on the preselection criteria or if decides to invite only the best applicants after pre-sorting by the algorithm. The GDPR is, however, deemed to have been violated if

³⁶⁹ See n 365 above.

³⁷⁰ *Ibid.*

³⁷¹ Dzida and Groh, 'Rechtliche Risiken beim Einsatz von Algorithmen im Betrieb' (2018) ArbRB 2018 179 ff.

the rejection is made by a chatbot without human monitoring because the online applicant did not achieve a particular score in a preceding test.

In a business context, positive decisions can include job offers, promotions, provision of company pension benefits, bonuses, or other benefits such as admitting a child to a company kindergarten. It is worth remembering, however, that every promotion is connected with an obligation to perform another task, and any bonus received that does not equal the maximum bonus amount can be seen as a case of being denied the maximum bonus. Therefore, it is **advisable to double-check** how appropriate the bonuses automatically calculated are.

c) DOES AI MAKE NON-DISCRIMINATORY DECISIONS?

At first glance, it would appear that AI supervisors make more transparent decisions than human supervisors. However, the criteria for decision-making are generally unknown, which means that AI decisions are **non-transparent**. Furthermore, in choosing the 'best' applicant or making the 'best' decision, the algorithm uses statistics that could sometimes include **prejudices** with discriminatory factors.³⁷²

- In a test run of a software for career opportunities by the Austrian Labour Market Service, for example, **women were assigned fewer opportunities** solely on the basis of their gender.³⁷³ This tendency was not based on a human presetting but occurred specifically as a result of the software's machine learning. The reason for this discrimination was that the software used application letters from the past as a basis for its decision. Women had more gaps in their CVs due to periods of care, so the algorithm assumed that they are less suitable.
- A similar problem occurred at **Amazon**, which had developed an AI to evaluate applicants with a score and thus simplify the pre-selection process. The system was trained with the CVs of applicants from the last ten years, most of whom were male. From this, the system concluded that Amazon favoured male applicants. It therefore discriminated against the CVs of female applicants in which words like 'woman' or 'women's chess club president' appeared. In turn, it favoured resumes from male engineers that included combative words such as 'executed' and 'captured', which were more common in CVs of male applicants. As a result, the project was shut down.³⁷⁴
- Other programs acted in a **racist manner** or did not recognise the faces of Black people in the first place. At **TaskRabbit**, where workers can offer

372 See www.spiegel.de/netzwelt/netzpolitik/rassistische-algorithmen-ki-forscherin-mutale-nkonde-im-interview-a-1271778.html (last accessed on 3 September 2024).

373 See www.faz.net/aktuell/karriere-hochschule/buero-co/ki-im-bewerbungsprozess-und-raus-bist-du-17471117.html (last accessed on 3 September 2024).

374 See www.reuters.com/article/us-amazon-com-jobs-automation-insight-idUSKCN1MK08G/ (last accessed on 3 September 2024).

services and are ranked by an algorithm, a study showed that women received fewer reviews and Black (male) workers especially received worse ratings than Asian and white workers. It turned out that the algorithm was flawed due to the users. There was no evidence that the algorithm was designed to rank based on demographic features; it just takes account of the customers' behaviour (eg, ratings, reviews, clicks on profile). However, the customer feedback on TaskRabbit was biased, which caused the search algorithm to exhibit bias and thus reinforced the human bias.³⁷⁵

These practical implementations show that the use of AI is not certain to offer neutral and fair decisions. Instead of contributing to more diversity, programs can in fact reinforce patterns of discrimination.³⁷⁶

Further risks can occur if AI-based **algorithms change due to regular feedback provided by people or 'trolls'**. In the cases mentioned above, the algorithm was systematically discriminating against certain people. This raises the question of whether AI represents the users' (including the employers') opinions or the programmers' opinions, or whether AI is neutral and therefore open to manipulation. Regardless of that broadly discussed question, discrimination by an algorithm in an application process or an ongoing employment relationship can always be attributed to the employer due to the employer's use of the algorithm and the fact the employer did not control the algorithm's decision.

For this reason, many of the leading AI companies state that they are **in favour of controlling the technology**. Around 80 per cent of corporate AI experts think AI should not be used without human oversight.³⁷⁷ Especially in the case of possible discrimination, employers should inspect their technology regularly. In addition, the following **rules** should be considered when integrating AI processes into an **application process**:³⁷⁸

- in an application process, developers have to teach their algorithms not to discriminate against people (eg, by asking inadmissible questions);
- diversity must be ensured among developers and responsible HR teams;
- machine learning models must be optimised for fairness, accountability, transparency and editability; and
- a charter of human rights or ethical guidelines regarding the use of AI must be integrated into the AI-based algorithm.

375 Casten Orwat, 'Risks of Discrimination through the Use of Algorithms', 30 f, See www.antidiskriminierungsstelle.de/EN/homepage/_documents/download_diskr_risiken_verwendung_von_algorithmen.pdf?__blob=publicationFile&v=1 (last accessed on 3 September 2024).

376 See www.faz.net/aktuell/karriere-hochschule/buero-co/ki-im-bewerbungsprozess-und-raus-bist-du-17471117.html (last accessed on 3 September 2024).

377 See <https://cf-fachportal.de/meldungen/kuenstliche-intelligenz-unternehmen-wuenschen-sich-mehr-kontrolle/> (last accessed on 3 September 2024).

378 See <https://qz.com/work/1227982/ai-and-discrimination-what-tech-companies-can-do/> (last accessed on 3 September 2024).

H. NEW WORKING FORMS AND THEIR CLASSIFICATION

Instead of relocating production sites to low-wage countries or using temp agency workers, companies will focus on their core competencies and outsource other activities in a cost-effective manner via platforms.

The global trend is for **Work 4.0** to turn away from traditional employment structures, prompting a rise in self-employment.³⁷⁹ Even in European countries, where the average hourly paid wage is usually higher than the salary that can be earned through platforms, the **platform economy** is becoming more and more common. Larger companies are increasingly using external workers rather than hiring new employees. An estimated 81 per cent of companies are using freelancers to reduce costs and to fill skill gaps.³⁸⁰

In the EU there were 28.3 million digital platform workers in 2022,³⁸¹ which was more than 14 per cent of the EU workforce. Therefore, the platform economy is already a significant part of the economy and is expected to grow rapidly. Recent numbers show that the demand for gig workers is between 20 and 30 per cent in different industries and growing.³⁸² The EU estimates that there will be 43 million gig workers in 2025, an increase of 52 per cent in just three years,³⁸³ accounting for more than 21 per cent of the European workforce. In addition, the platform economy generated around €20bn in the EU in 2020.³⁸⁴ At the same time, the EU expects five million platform workers to be misclassified as self-employed rather than employees as early as 2023, with the result that worker protection rules will not apply to them.³⁸⁵

For this reason, the European Council and the European Parliament agreed on an EU directive to improve working conditions for platform workers in March 2024.³⁸⁶ Member States have two years from its formal adoption to implement the directive. The most important **new regulation** is the **rebuttable presumption** that a platform worker is an employee if **certain**

379 See www.oecd.org/els/emp/Policybrief-per cent20per cent20Automationper cent20andper cent20Independentper cent20Workper cent20inper cent20aper cent20Digitalper cent20Economy.pdf p.3. (last accessed on 3 September 2024).

380 See www.forbes.com/sites/tracybrower/2022/09/11/what-its-really-like-to-be-a-gig-worker/?sh=69029ce66507 (last accessed on 3 September 2024).

381 See www.consilium.europa.eu/en/infographics/digital-platform-workers/ (last accessed on 3 September 2024).

382 See www.rolandberger.com/en/Insights/Publications/The-future-of-the-gig-economy.html (last accessed on 3 September 2024)

383 See n 381 above.

384 Falter, 'Crowdworking/Plattformarbeit – Revolution des Arbeitsmarktes?' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 127.

385 See www.consilium.europa.eu/en/policies/platform-work-eu/ (last accessed on 3 September 2024).

386 See www.consilium.europa.eu/en/press/press-releases/2024/03/11/platform-workers-council-confirms-agreement-on-new-rules-to-improve-their-working-conditions/ (last accessed on 3 September 2024).

criteria indicating control are met. However, these **criteria can be defined by Member States**.³⁸⁷ The original proposal, which was **not adopted**, also provided for a rebuttable presumption of employment if **two of five criteria** were met.

The application of the legal presumption results in an obligation for the platform to prove that no employment relationship exists in proceedings where the correct employment status of the person working for the platform is at stake. The rules should be transposed into national laws by 2026.

Belgium and Portugal have already introduced such a rebuttable presumption. With the so-called '**Rider Law**', **Spain** has defined platform workers in the delivery sector as employees unless the contrary is proven.³⁸⁸ **Most other EU Member States** have legislation or jurisprudence that does **not provide for such a presumption**, but instead case law lists a number of indications where **the burden of proof** is on the alleged self-employed person.

I. Types of platforms

One of the main challenges for lawmakers is **how to define platform workers** to create a legal framework. In the EU, the platform economy has grown from revenues of €3.4bn in 2016 to €20bn in 2020.³⁸⁹ Furthermore, 20 per cent to 30 per cent of the working-age population of the EU has earned income through gig platforms.³⁹⁰

In the US, recent research has found that 36 per cent of the workforce is part of the gig economy and earns some money via platforms.³⁹¹ Most of the workers work 10–20 hours per week and receive an average hourly payment of US\$7–15.³⁹² The salary is therefore often based on minimum wage, which is US\$7.25 in the US, although individual states may set the minimum wage higher.³⁹³ Of these workers, 29 per cent could be seen as '**platform-dependent workers**' and receive almost all their income from work arranged via one platform.³⁹⁴ Only this group is interesting from a point of view of labour and employment law. Social protection is therefore typically derived from the fact that workers have another job or are students.

387 *Ibid.*

388 See <https://leglobal.law/2024/04/19/eu-platform-work-directive-set-to-be-approved/> (last accessed on 3 September 2024).

389 See n 381 above.

390 See www.europeangeneration.eu/single-post/the-european-gig-economy (last accessed on 3 September 2024).

391 See n 380 above.

392 *Ibid.*

393 See www.usa.gov/minimum-wage#:~:text=Theper cent20federalper cent20minimumper cent20wageper cent20is,atper cent20leastper cent20per cent247.25per cent20perper cent20hour (last accessed on 3 September 2024).

394 See www.denkfabrik-bmas.de/fileadmin/Downloads/Publikationen/Brief-3_Schor_final_FINAL-ua.pdf, 5 (last accessed on 3 September 2024).

However, the **highest demand** on five major online platforms (upwork.com, freelancer.com, fiverr.com, toptal.com and guru.com) is for **software developers**. Job postings on online platforms have increased worldwide in recent years. This growth is mainly driven by developed countries. The number of platforms in G20 countries has increased from 128 to 611 over the past decade. This accounts for 79 per cent of the platforms operating worldwide in 2021. Despite this, most platform workers come from developing countries (eg, India: 20 per cent).³⁹⁵

In general, platforms and their users can be categorised. There are different legal challenges in each category:

- **Sharing platforms:** tax problems: distinction between private and professional users;
- **Online marketplaces:** tax problems: how to ensure uniform and general taxation (eg, in the EU);
- **Social media platforms:** data privacy issues: how to ensure compliance with restrictive data protection laws and how to avoid fake news, deep fakes, and (racial) harassment; and
- **Crowdworking platforms:** labour and employment law: employment status, social protection; but also, tax issues. Regarding the crowdworking platforms, a distinction between local and global services must be made. Labour and employment law issues may only arise in the first category.

While unions focus on the disadvantages and risks of platform working, below are some of the advantages.

- Digitalisation, platform-based working, and flexible work agreements offer opportunities for those who may not be able to work in more conventional ways.³⁹⁶
- Platforms offer heterogeneity and innovative working results.
- Platforms provide workers with flexibility regarding their working hours and workplace.
- Crowdworkers in low-wage countries make good money.
- Platform work allows workers to earn money from microtasks, which are very easy and can be done while sitting on the bus or walking.

395 See https://ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_814417.pdf, 6 f (last accessed on 3 September 2024).

396 See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/679767/180206_BEIS_Good_Work_Report__Accessible_A4_.pdf (last accessed on 3 September 2024).

- Platform work can serve as a means to gain various skills. Engaging in different gigs or tasks allows workers to gain experience across multiple projects or sectors.
- Platform work imposes no restriction regarding working for other clients as well.
- The situation for highly qualified freelancers, primarily from the IT sector, is different; they are better paid and can achieve hourly wages that are comparable to the standard wages for permanent employees. It is therefore incorrect to presume that their legal relationships are precarious.

The number of platform workers will increase the **risk of precarious working conditions** (low wages, short working hours, no paid leave and sick pay, no training), and legal uncertainty regarding taxes.³⁹⁷ Employee numbers will decrease, and there will be more project workers in companies than traditional employees; consultants and crowdworkers will increase in the short term. Owing to the simplicity of some tasks, the trend toward crowdworking as a result of digitalisation is likely to abate, since small routine tasks, in particular, can be digitalised.³⁹⁸

II. Classification of groups of workers

1. Contractual structure

Platform workers only accept the platform's terms and conditions. Employment relationships do not exist in most cases. Instead, the **contractual relationships** are **brokerage** or **service contracts**. **Crowdworking**, also known as crowdsourcing, refers to a method of assigning tasks or projects via (usually digital) platforms. Companies (crowdsourcers) outsource specific tasks or entire projects by posting them on a platform accessible to the 'crowd'. Crowdworkers can then complete these tasks in exchange for compensation. The tasks offered vary widely in terms of hourly rates, depending on their scope and complexity. Crowdworking is used for simple, small tasks (such as categorising photos) and highly specialised activities, particularly in the IT sector. While some tasks require on-site work (such as food delivery), many can be done remotely from anywhere (such as programming).³⁹⁹ Under most contract laws, a separate service contract for each task between the crowdworker and the crowdsourcer, sometimes in the form of a non-written contract for microtasks, could result from the acceptance of a result proposal from the crowdworker. This means that there is no obligation for either party to accept the other's offers, but there is a payment obligation after

397 See www.eesc.europa.eu/sites/default/files/files/qe-05-21-286-en-n_0.pdf (last accessed on 3 September 2024).

398 Moussavian, 'Work 4.0 Megatrends Digital Work of the Future – 25 Theses', 47.

399 Falter, 'Crowdworking/Plattformarbeit – Revolution des Arbeitsmarktes?' in Knappertsbusch and Wisskirchen (eds), *Die Zukunft der Arbeit* (Leopoldina, 2023) 127.

the acceptance of the agreed task.⁴⁰⁰ There is a distinction between **external crowdworking** and **internal crowdworking**. Internal crowdworking offers companies a new way to distribute tasks internally to their own employees, who can apply for these tasks. In this scenario, the company's employees form the crowd. External crowdworking, by contrast, targets individuals outside the company – essentially anyone with the technical means (ie, an internet connection and a smartphone) to access the crowdworking platform. Within external crowdworking, a further distinction is made between **direct** and **indirect crowdworking**: the former occurs when there is a direct contractual relationship between the client and the crowdworker. Typically, however, the crowdworker enters into an agreement with a third party (the crowdworking platform), which then enters into a contractual relationship with the client offering the job (indirect crowdworking).⁴⁰¹ It must be noted that the classification depends mainly on real circumstances, not on the name the parties give to their relationship, and this report cannot make an analysis of contract law around the world. When European crowdworkers were asked about their employment situation, they traditionally identified themselves as independent workers or contractors, as the work provides a substantial amount of freedom and flexibility.⁴⁰²

However, under most legal systems in contract law, there are the same legal challenges: defining platform workers, dependent workers and crowdworkers as **freelancers** without integrating them into the employer's or the platforms' business; establishing fair working conditions, for example, for compensation and working time; and finding out which law applies in general, especially which tax regime and social security and welfare rules apply.

2. *Legal consequences of false classifications*

Crowdworking platforms offer a wide range of services, which are often brokered globally. In these cross-border relationships, there is usually no danger that the crowdworkers will be classified as employees. However, many court rulings in Europe, the US, and Canada have shown that in **local services provided through platforms, workers are often classified as employees**.⁴⁰³ This is mostly because the service is offered as a part of the clients' total service, and controls by the clients are stronger. In this case, the worker has the same employment rights as the platforms' or the crowdsourcers' employees. Depending on the law in the specific country, this classification could have numerous legal consequences:⁴⁰⁴

400 Arnold and Günther, ArbR 4.0 (2nd edn, 2022), s 2 'Neue/Alternative Beschäftigungsformen' en 94.

401 See n 399 above.

402 See www.freshfields.com/49956a/globalassets/our-thinking/campaigns/beyond-the-pandemic/wl-2.0/where-do-platform-workers-stand---status-and-protection-in-europe-and-the-us.pdf (last accessed on 3 September 2024).

403 *Ibid.*

404 Fuhlrott and Mai, 'Sind Crowdworker künftig immer Arbeitnehmer? – Teil 2' (2021) ArbRAktuell 285.

- void contracts and legal uncertainty;
- fines for wrongful classification for crowdsourcers and platforms;
- workers have the same employment rights as platforms' or crowdsourcers' employees (eg, minimum wage, sick pay, maternity leave);
- platform companies have to guarantee employees' rights instead of freelancers' rights;
- fines can be issued to all parties (including crowdworkers) for failing to pay social security contributions and taxes (income and VAT);
- criminal law issues; and
- retrospective payment is issued for leave not granted during the period of incorrect classification.⁴⁰⁵

3. *Employees and independent contractors*

In most countries, national lawmakers and courts have developed certain **criteria to distinguish between employees and freelancers**. A worker under European law is anyone who pursues or proposes to pursue an activity that is real and genuine for another person under the direction of that person and who performs services in return for remuneration. According to the CJEU, the nature of the activity is, in principle, irrelevant as long as the employment is not shown to be wholly insignificant.⁴⁰⁶ However, the most important factor is whether the worker is subject to instructions or not.

Based on that broad definition, the CJEU rendered a major ruling in 2017 regarding **Uber** drivers that had particularly important implications for the entire gig economy in Europe as well as for employment law generally. Among other things, the CJEU used the same arguments as, for example, the UK Supreme Court, which has granted drivers a claim to the statutory minimum wage in the UK.⁴⁰⁷ In the UK, the claimant was classified as an employee. Uber drivers are not self-employed and should be paid the 'national living wage'. The main reason for the classification of drivers as 'workers' is the strict specifications and regular checks that Uber imposes on them. Violation of the regulations may result in the driver being denied work.⁴⁰⁸

405 See www.e-recht24.de/news/arbeitsrecht/10644-urlaubsanspruch-urlaub-rueckwirkend-nehmen.html (last accessed on 3 September 2024).

406 See www.bmas.de/EN/Europe-and-the-World/Europe/Working-in-another-EU-country/Mobility-within-the-EU/free-movement-of-workers.html (last accessed on 3 September 2024).

407 See www.supremecourt.uk/cases/docs/uksc-2019-0029-judgment.pdf (last accessed on 3 September 2024).

408 See www.bundestag.de/resource/blob/840392/3bb3f9762417e316f46ed35d3d870225/WD-6-007-21-pdf-data.pdf (last accessed on 3 September 2024).

The same applies to other driving and courier services. In March 2023 the Supreme Court in the Netherlands ruled that **Deliveroo** drivers should be considered employees. The ruling found that Deliveroo's drivers were dependent on the platform and thus should enjoy employee rights.⁴⁰⁹

However, different principles could apply to the sharing of accommodation. Companies such as AirBnB, Wimdu, and 9Flats operate on the basis of joint consumption of already existing consumer goods. Where driving services (Uber, Lyft, Wunder) are arranged, the focus is not on joint consumption, but on brokering additional journeys that otherwise would not have taken place at all.

Besides traditional criteria to distinguish employees from freelancers, the following criteria should be taken in account as well:⁴¹⁰

- whether integration into the crowdsourcer's information and data network is required to fulfil the task;
- generally, no payment for unsuccessful efforts, but exceptions exist under certain circumstances (eg, if the crowdsourcer changes plans and the freelancer's work up to now is unusable);
- whether the freelancer's working steps (not the overall result) are controlled by the crowdsourcer's or platform's software (eg, through a keylogger or data profiles);
- whether the task belongs to the company's core competences, and whether the crowdsourcer's employees do equivalent tasks;
- in the US, the following criteria are important (**Borello Test** from 1989):⁴¹¹ the individual factors cannot be applied mechanically as separate tests; they are intertwined, and their weight depends on particular combinations:
 - right to control the manner and means of accomplishing the result desired;
 - right to discharge at will and without cause;
 - whether the one performing the services is engaged in a distinct occupation or business;
 - kind of occupation, with reference to whether the work is usually done in the locality under the direction of the principal or by a specialist without supervision;
 - skill required for the particular occupation;

409 See www.ey.com/en_nl/tax/tax-updates/meal-delivery-riders-are-employees (last accessed on 3 September 2024).

410 Wisskirchen and Schwindling, 'Crowdworking im Lichte des Arbeitsrechts' (8/2017) ZESAR, 318, 327.

411 See <https://caselaw.findlaw.com/ca-supreme-court/1774638.html> (last accessed on 3 September 2024).

- whether the principal or the worker supplies the instruments, tools and the place of work for the person doing the work;
- length of time for which the services are to be performed;
- mode of payment, whether by the time spent or by the work produced;
- whether the work is part of the regular business of the principal; and
- whether the parties believe they are creating an employer–employee relationship.

A different approach was chosen by the Supreme Court of California in 2018 in a judgment against a delivery service that operates with drivers as independent contractors.⁴¹² Under the **ABC test**: a worker is considered an independent contractor if the hiring entity establishes a burden of proof:⁴¹³

- that the worker is **free from the control and direction** of the hirer in connection with the performance of the work, both under the contract for the performance of such work and in fact; and
- that the worker performs **work that is outside the usual course** of the hiring entity's business and that the worker is customarily engaged in an independently established trade, occupation or business of the same nature as the work performed for the hiring entity.

Unlike in all other procedures, the **burden of proof is now on the business** to demonstrate that every worker is not an employee by proving all these elements (otherwise, the incorrect classification can cost companies up to 30 per cent more per worker than an independent contractor in the US).

In Canada, the Ontario Labor Relations Board (OLRB) ruled in favour of platform workers in 2020 in the case of *Independent Workers Association of Ontario v Foodora Inc.* In this case, the OLRB ruled that food delivery workers for **Foodora** were dependent contractors and therefore had the right to unionise under the Ontario Labor Relations Act.⁴¹⁴

4. *Dos and don'ts*

Even the ABC test from the US courts (in California and New Jersey) would not come to the conclusion that every platform worker is classified as employee. The main reason why more and more platform workers are complaining is the **lack of**

412 *Dynamex Operations West Inc v Superior Court of Los Angeles County*, 1 May 2018. See <https://law.justia.com/cases/california/supreme-court/2018/s222732.html> (last accessed on 3 September 2024).

413 See n 402 above.

414 See <https://ehlaw.ca/ontario-labour-relations-board-issues-first-decision-regarding-workers-in-the-gig-economy-food-app-couriers-permitted-to-unionize/> (last accessed on 3 September 2024).

social protection (eg, in the event of a decline in orders or illness or in old age). It is advisable to use models such as those in Spain, in which ‘solo self-employed persons’ are also required to pay social security contributions (pension and health insurance) or in Italy, where self-employed persons are required to provide proof of insurance. This issue should be on the lawmakers’ agenda.

To avoid crowdworkers being classified as employees, it is essential to only assign them tasks, set targets or agree on results with them. It is important **not to give instructions concerning individual working steps**. In a contract for work and services, the platform companies should agree on conditions regarding the modification, cancellation or expansion of the given task. Besides the contractual structure, the practical contract implementation should be observed as well.

The following detailed **recommendations** should be considered in dealing with crowdworkers to **avoid their classification as employees**.⁴¹⁵

- Payment of VAT (if applicable), not income tax.
- Meetings and discussions should aim to reach agreement, not unilaterally dictate instructions.
- Crowdworkers should not act in the name of their platform company. They should not issue any statements, conclude any contracts, sign any documents, etc.
- The parties should agree on a representative of the platform company to act as the central contact person for every matter.
- Crowdworkers may not be perceived as employees based on their external appearance. Therefore, for example, no company business cards; if necessary, using ‘on behalf of’ to illustrate their role as crowdworker.
- No (regular) feedback talks should be held between crowdworkers and employees, and no work-related directives should be issued by crowdworkers to employees.
- Important: avoid a contract for work and services with previous employees.
- Allow the crowdworker to work for more than one client. However, you can agree on a non-competition clause (if such a clause is provided for in the legal system) while the crowdworker is working for your company.
- Crowdworkers should be remunerated variably or depending on success. They should issue invoices that are verified and then paid.

415 See n 410 above.

- No instruction to attend training sessions, meetings, company events, etc (if necessary: invite crowdworkers as ‘visitors’ and explicitly state that attendance is voluntary and the crowdsourcer does not bear the costs).
- Prefer crowdworkers who have their own registered businesses (eg, entry in the commercial register, their own letterhead/email/website/app).
- Crowdworkers should work with their own operating resources. The expenditures incurred because of this should be covered by the fees. In particular, crowdworkers should not be provided with any IT support.
- Crowdworkers typically bear the risk of loss of fees because of illness/vacation/holiday.
- Avoid the responsibility of a crowdworker for recurring tasks or core tasks.
- Crowdworkers should not have access to sensitive data (eg, personal data of employees or clients).
- Do not give crowdworkers so many different orders that they work only for your company over an extended period.
- Do not dictate specific working hours or workplaces to crowdworkers. No assigned company-specific email or titles.
- Avoid contract provisions like ‘supports us by...’.
- If instructions are absolutely necessary, only give single instructions.
- Keep the reporting obligations to a minimum.

III. Prohibition of secondary employment/exclusivity clauses

Especially in times when there is a strong outflow of knowledge, bans on secondary employment have usually been part of employment contracts. However, in European countries, these bans will no longer be possible once the EU Directive on Transparent and Predictable Working Conditions is transposed into national law.⁴¹⁶ **Employers will be prohibited from preventing a worker from taking up employment with other employers** outside the work schedule established with the employer. All EU Member States are required to have transposed the Directive into national law by now, and all but Greece, Luxembourg and Spain have done so.⁴¹⁷ As of 1 August 2022, employers must ensure that employment contracts with people working more than three hours per week over a four-week period (ie, over 12 hours per month) comply with the new rules. It is possible that

⁴¹⁶ See <https://ec.europa.eu/social/main.jsp?langId=en&catId=1313> (last accessed on 3 September 2024).

⁴¹⁷ See https://ec.europa.eu/commission/presscorner/detail/en/inf_23_2707, <https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=CELEXpre cent3A32019L1152> (last accessed on 3 September 2024).

Member States may decide to apply some limited exemptions where this is justified by objective circumstances.⁴¹⁸

It is not yet clear whether old secondary employment prohibitions are still valid. Since this form of **know-how protection** could be eliminated in the future, confidentiality agreements and the precise definition of trade secrets will be more important than ever. In addition, working time legislation must be observed in Europe. With regard to compliance with the maximum weekly working hours of 48 hours and the daily rest periods of 11 hours, the time spent on different working relationships must be considered together.⁴¹⁹

IV. Alternative solutions without expanding employment scope

Besides adopting the current position of unions and increasing the scope of employment relationships, there are other possible solutions:

- European Directive on Transparent and Predictable Working Conditions; and
- adapting/introducing social security systems.

1. *European Directive on Transparent and Predictable Working Conditions*

The European Parliament adopted Directive 2019/1152 on 16 April 2019, requiring employers to provide written information on essential employment aspects. Member States had to transpose this directive into national law by 1 August 2022, and most have complied.

The directive broadly defines '**worker**' to include those in **atypical employment**, such as on-demand, intermittent, voucher-based or platform work, excluding only freelancers. However, there are ongoing discussions about classifying platform workers under this directive.⁴²⁰

Employers must now provide written information on:

- duration and conditions of probation periods;
- entitlement to training and annual leave;
- job function and work description;
- social security contribution details; and
- additional details for employees working abroad.

418 See n 416 above.

419 See www.deutsche-handwerks-zeitung.de/arbeiten-nach-feierabend-was-bei-zweitjobs-gilt/150/3098/344934 (last accessed on 3 September 2024).

420 See n 416 above.

Employers cannot prohibit workers from taking other jobs but can set compatibility conditions. Non-compliance can result in fines and more favourable presumptions for employees, such as treating contracts as **indefinite** if no time limit is provided.⁴²¹

2. *Adapting/introducing social security systems*

Instead of making all platform workers employees, **social security systems can be adapted**. In principle, European Member States have legislative competence for all branches of social security. The EU is only empowered to verify compliance with the principles of European law. This primarily includes the principle of equal treatment. The best solution for European countries would be the **introduction of a mandatory social security system** regardless of whether the worker is considered an employee, a dependent worker or a freelancer. In certain Member States like Spain, 'solo self-employed persons' are already required to pay social security contributions (pension and sickness insurance), and in Italy self-employed persons are required to provide proof of insurance before accepting an offer for work. In Austria and Finland, there are also compulsory social security systems for self-employed workers.⁴²² In these countries, employers are required to give notice about their employees and to pay social security contributions.

421 *Ibid.*

422 See [http://www.europarl.europa.eu/RegData/etudes/STUD/2017/614184/IPOL_STU\(2017\)614184_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2017/614184/IPOL_STU(2017)614184_EN.pdf), 86 (last accessed on 3 September 2024).

I. SOCIAL MEDIA IN COMPANIES

Owing to advancing digitalisation and increased networking of people, social media is a more important factor for a company's public and internal image than ever before. With 350,000 Tweets, 5.9 million Google queries and 1.7 million pieces of information shared on Facebook per minute in 2022, the significance of social media for corporate advertising purposes is clear.⁴²³ Especially for the younger generation, the range of YouTube channels and influencers on Instagram is much greater than that of newspapers or TV advertisements. Intelligent algorithms are also used on social media platforms to create posts and personalise advertising.

At the same time, social media is being used ever more intensively for marketing purposes within companies because networking is becoming more and more important in a global world; depending on the product, more potential buyers can be reached via social media channels than via traditional means of advertising. This naturally breaks down the barrier between private and commercial use.

I. Use of social media by employees

In principle, employers can prohibit their employees from using social media services during working hours. Normally, however, they have no interest in doing so, since the staff is supposed to be networking with potential customers and using social media for marketing. It is important to find **practical solutions here to regulate use** in a way that is in line with the principle of equality and to consider the potential rights of the employee representatives to be informed. Employee representatives should be involved in different ways depending on the country. In Italy, Spain and the UK, employee representatives are not involved at all, and the employees merely have to be informed; the regulation on company social media usage in Germany requires the consent of the employee representatives; and in Belgium and France consultation with the employee representatives is required.⁴²⁴

Irrespective of employee representatives' participation and GDPR issues, the question as to whether the measure itself is permissible must be answered. When introducing any guidelines regarding the use of social media, employers must take into account that they are restricting the employees' freedom of expression and their general personal rights. When a fundamental right under EU law is restricted, the interests of the employees concerned must always be given due consideration.⁴²⁵ This means:

423 See www.statista.com/statistics/195140/new-user-generated-content-uploaded-by-users-per-minute/; www.dsayce.com/social-media/tweets-day/ (last accessed on 3 September 2024).

424 See www.cms-lawnow.com/ealerts/2017/05/technology-at-the-workplace (last accessed on 3 September 2024).

425 *Ibid.*

- employees are required to behave in an overall manner that is not detrimental to the employer’s legitimate interests in accordance with their positions and that they are required to protect these interests to a reasonable extent (duties of loyalty); and
- employees are in principle entitled to express their own opinions, including on the internet, and to comment on operational matters.

Generally, however, there are **typical rules** that should be included in all guidelines, codes of conduct or works agreements. Examples of these include:

- regulations on entitlement to private use (when, who, how long);
- regulations on use for business purposes;
- the employer’s monitoring options;
- information on the laws to comply with;
- data protection and copyright law aspects;
- security aspects;
- general requirements for respectful and lawful interaction with colleagues, customers, and competitors; and
- legal consequences for conduct in case of breach of duty.

II. Use of social media by employee representatives

Intelligent social media use by employees and employee representatives can become a major risk for employers. Digital groups on social networks can foster **greater group dynamics** than a traditional demonstration. Employees feel better protected by the anonymity of the internet. By regularly exchanging/forwarding/posting content on social networks, solidarity with affected workers can develop among potential customers. Other employee representatives, or people in similar situations, can get to know the concerns of workers much faster and act as potential virtual supporters within a very short time, giving the employees’ concerns greater legitimacy. This broad public support increases the pressure on employers at the same time. A well-supported online campaign can very quickly become a traditional offline campaign with far more supporters.

For example, 200 employees in their fight for a minimum wage of US\$15 in New York’s catering industry (‘Fight for 15’ initiative)⁴²⁶ received 300,000 Likes on Facebook for their issue within a very short time. With the virtual support of

426 See www.nycfoodpolicy.org/timeline-nyc-fast-food-workers-make-strides-in-wage-war/ (last accessed on 3 September 2024).

300,000 potential customers, the 200 employees had a much better negotiating position vis-à-vis their employers than before.

In addition, social media is still the **best way to attract younger employees** to an employee representative organisation. Unions no longer have to become politically active to recruit members. Especially young and well-trained employees in the service sector want to benefit from membership and want their employee representatives to raise awareness for the issues affecting them.⁴²⁷ In this context, increasing use of social media by company works councils can be observed, communicating both internally and externally about working conditions in the company and other work-related issues on social media.⁴²⁸

If employers do not react appropriately, a public relations crisis might follow. Online agitation can therefore be seen as the new form of industrial action. However, social media can also be used to keep management informed and allow employers to communicate via their own social media channels.

III. Use of wearables, apps, and nudging/control devices

I. Employee Data Protection

The use of wearables involves **processing a large amount of personal data** relating to employees. These are, for one, data relating to the working environment and, for another, data relating to the employees' performance. It is therefore necessary to comply with data protection requirements, which in Europe include the restrictive provisions of the GDPR. Regarding the processing of employees' personal data, the principle that data processing is generally prohibited unless permission has been granted applies. Since the use of certain wearables allows the employer to fully monitor employees by drawing conclusions from the data collected, the use of wearables is generally not permitted unless the employee's consent is granted in accordance with data protection provisions. **Consent** granted in such a way is, however, **legally binding** only if it is **given voluntarily**, for a **specific purpose**, and on the basis of an **informed decision**.⁴²⁹ In the employment context, the requirement for the consent to be voluntary in nature is met only if the data subject **is free to refuse or revoke consent** without having to fear any disadvantages.⁴³⁰ An example of consent given voluntarily in the employment context is the wearing of a fitness bracelet for a company health programme, since participating in this programme has nothing

427 See <https://link.springer.com/download/epub/10.1007percent2F978-3-030-24914-4.epub>; <https://udemuth.de/wp-content/uploads/2019/03/Germany-spotlight-on-increasing-rising-use-of-social-media-by-company-works-councils-Planet-Labor.pdf> (last accessed on 3 September 2024).

428 See <https://udemuth.de/wp-content/uploads/2019/03/Germany-spotlight-on-increasing-rising-use-of-social-media-by-company-works-councils-Planet-Labor.pdf> (last accessed on 3 September 2024).

429 See n 356 above.

430 Maschmann, 'Führung und Mitarbeiterkontrolle nach neuem Datenschutzrecht' (2018) NZA-Beilage 115.

to do with the implementation of the employee's employment relationship. Other national peculiarities (such as the written form requirement) are also to be observed in every Member State.

2. *Statutory criteria of permissibility*

The employer may process data if such data is necessary for implementing the employment contract or if the employer has a legitimate interest which outweighs the employees' interest in the protection of their privacy. The **principle of proportionality** is to be applied when assessing the necessity of data processing. Within European jurisdiction, the protection of general personal rights is safeguarded by the European Court of Human Rights (ECHR) and the CJEU. Owing to the amount of data collected, which could make it possible for employers to extensively monitor employees during their working hours, the employees' protection generally takes priority. Therefore, employers must take care to ensure that the **amount of data processed** by wearables in the individual case is **limited to a minimum**, and that only such data that is absolutely necessary for implementing the employment relationship is processed. If, in the individual case, the processing of data may be justified on a statutory basis, the employee is to be informed of this in a data protection notice.

3. *Participation rights of employee representatives*

In principle, employee representatives are more open to technical devices without autonomous decision-making powers that make the employees' work easier and/or safer than they are to AI, which is often considered the reason for numerous job cuts. Irrespective of whether wearables are permissible under data protection law, the employer's decision to include wearables as working equipment at the workplace may trigger employee representatives to exercise their participation rights. If the working equipment used constitutes technical equipment introduced to monitor the conduct or performance of employees, co-determination rights may apply in Germany, for example. The use of wearables is not permitted without the consent of the employee representatives irrespective of whether the employer intends to monitor employees.⁴³¹ The obligation to inform and consult employee representatives and/or the employees affected also exists in other EU Member States. It is therefore customary in Europe to conclude a collective agreement regarding the use of wearables in accordance with the applicable national law. Because statutory criteria of permissibility relating to data processing may differ, it is particularly important to comply with EU-wide data protection standards. 'Big Brother is watching you' is the most common statement of unions concerning integration of modern techniques into companies.

431 See n 356 above.

J. HOMEWORK FOR POLICYMAKERS: CREATE A FLEXIBLE AND UP-TO-DATE LEGAL FRAMEWORK

Digitalisation concerns the way people interact with one another and with technology and is therefore a sociopolitical topic featured in new headlines in the newspapers every day. Questions that are particularly relevant from a sociopolitical point of view include dealing with platforms, dealing with ethical issues regarding AI, and integrating workers replaced by AI. These issues go far beyond employment and social insurance law.

But this development is nothing new. New laws such as commercial law, corporate law, and labour and employment law were created during the industrial revolution.⁴³² The same applies to the revised liability law, road traffic law and energy law in the course of electrification and increased use of automobiles.

As AI is introduced into business operations, the following fields of law will have to be fundamentally reformed:

- regulation of autonomous systems (eg, autonomous driving);
- responsibility for data obtained from the use of AI;
- IP rights regarding inventions developed by AI;
- business/corporate law;
- protection and handling of personal data by AI;
- AI-based smart contracting; and
- distribution of liability when using AI.

As a result of these technical changes, labour and employment law principles will need to be revised. The EU Commission proposes that national and international legislators should act and legislate to shape the future world of work and employment.⁴³³ This report deals exclusively with setting primarily rules regarding:

- integration of AI into the workplace;
- more flexible working hours;

432 See www.lexology.com/library/detail.aspx?g=ad2a3da2-78c7-4686-bd80-cb95376750bf&utm_source=lexology+daily+newsfeed&utm_medium=html+email+-+body+-+general+section&utm_campaign=lexology+subscriber+daily+feed&utm_content=lexology+daily+newsfeed+2019-01-15&utm_term (last accessed on 3 September 2024).

433 Download at <https://op.europa.eu/en/publication-detail/-/publication/508a476f-de75-11e9-9c4e-01aa75ed71a1/language-en>, 6 (last accessed on 3 September 2024).

- better cooperation with employee representatives;
- information, consultation, and co-determination rights exercised by employee representatives;
- data protection;
- employee classification; and
- social security for freelancers.

I. Role of legal frameworks

Because digitalisation and automation are global and unstoppable processes that no one can ignore, lawmakers will also have to devote more attention to the topic of digitalisation to provide a practical legal framework.⁴³⁴

In many areas, laws cannot be interpreted by courts in line with the changing working environment anymore. In such cases, lawmakers must act and provide a **completely new framework**.⁴³⁵ Such a statutory framework is often necessary because uncertainty is bad for companies and their business models. In 2022, the EU agreed on a comprehensive regulatory package for online platforms. The **Digital Services Act** will complement the now 20-year-old E-Commerce Directive and update parts of it. It provides for uniform horizontal rules on due diligence and disclaimers for intermediary services (such as online platforms) and is thus intended to contribute to a safe, predictable and trustworthy online environment and the smooth functioning of the EU single market for intermediary services. However, third-party resolution of social issues (eg, requiring platforms to define codes of conduct to meet minimum social standards)⁴³⁶ is not an adequate substitute. It has often been the case in recent years that, by the time laws have been passed after several years of parliamentary procedure, they were already technically out of date when they came into force.

Policymakers must therefore be forward-looking and not reactive. When lawmakers act, the law should be structured to be flexible, since regular changes to the law can be expected as a result of the changing technology, and courts can act more quickly in their interpretation than lawmakers, who would need to make further amendments to a rigid law. German lawmakers, for example, have already made such a mistake, when they legally defined the 100-year-old term 'employee' in 2017.⁴³⁷ As already mentioned, however, integrating digital workers

434 See www.aerzteblatt.de/nachrichten/136616/Gesetzgeber-will-bei-Digitalisierung-nachjustieren (last accessed on 3 September 2024).

435 See n 432 above.

436 See <http://faircrowd.work/de/2017/06/19/eu-parlament-fordert-klare-richtlinien-fur-digitale-plattformen/> (last accessed on 3 September 2024).

437 See www.labourlaw-magazine.com/2017/06/26/digitisation-and-the-german-governments-work-4-0-white-paper/ (last accessed on 3 September 2024).

into business operations does not say anything about their positions as employees or freelancers, so this definition is already out of date.

II. Debureaucratisation

It is likely that everything that makes digitalisation possible in any form (even a diluted form) will be implemented. Most of the above-mentioned areas of European labour and employment law, however, are still based, in terms of their basic concept, on the situation at the beginning or middle of the 20th century and lag behind in terms of flexibility when compared to the international situation. The explanation is that most European lawmakers, like many unions, consider flexibility a matter that solely benefits the employer.⁴³⁸ True to this view, '**anti-flexibility measures**' are often adopted, and necessary reforms are delayed. This particularly concerns issues of labour law, the participation rights of employee representatives, and debureaucratisation. For example, although **lawmakers** consider '**remote working**' a benefit for employees, it considers on-call work, constant availability, platform work of solo entrepreneurs, and marginal employment (mini jobs) 'precarious working conditions to the detriment of the workers'. A frequently discussed case is the constant accessibility of employees. In some countries, laws concerning this already exist, for example in Belgium, France and Italy. At the European level, directives regulate working hours and rest periods or provide a framework for employees' health and safety. By August 2022, EU countries also had to implement a **directive on work-life balance**.⁴³⁹ However, this mainly concerns vacation arrangements or more flexible working hours. The French parliament passed a law in 2017 that gives employees the right to go 'offline' at the end of regular working hours ('*le droit à la déconnexion*').⁴⁴⁰ What is interesting about this regulation is that the law stipulates that the parties to the collective agreement must negotiate at least once a year on the treatment of the '*droit à la déconnexion*'. If no agreement is reached, the employer basically has the right – as an alternative – to unilaterally establish rules to create clarity for the employees.⁴⁴¹ The law does not, however, include an obligation for employees to go offline. Following the French initiative, Spain and Italy enacted comparable laws too, whereas in Germany, this topic is mostly negotiated by the social partners in a works agreement (eg, Volkswagen, Daimler, Siemens).⁴⁴²

438 See www.cms-shs-bloggt.de/arbeitsrecht/digitalisierung-arbeitswelt-rechtslage/# (last accessed on 3 September 2024).

439 See www.sueddeutsche.de/digital/geplantes-eu-recht-aufs-abschalten-offline-und-das-ist-auch-gut-so-1.5048735 (last accessed on 3 September 2024); [www.bmfsfj.de/bmfsfj/service/gesetze/vereinbarkeitsrichtlinienumsetzungsgesetz-vrug-198236#:~:text=Dieper cent20Richtlinieper cent20derper cent20Europper centC3per centA4ischenper cent20Union,amper cent20Arbeitsplatzper cent20weiterper cent20zuper cent20fper centC3per centB6rdern](http://www.bmfsfj.de/bmfsfj/service/gesetze/vereinbarkeitsrichtlinienumsetzungsgesetz-vrug-198236#:~:text=Dieper%20Richtlinieper%20derper%20Europper%20C3per%20A4ischenper%20Union,amper%20Arbeitsplatzper%20weiterper%20zuper%20fper%20C3per%20B6rdern) (last accessed on 3 September 2024).

440 See <http://www.lesechos.fr/economie-france/social/0211255545049-le-droit-a-la-deconnexion-va-devoir-faire-ses-preuves-2024663.php> (last accessed on 20 June 2023).

441 Thüsing, 'Weißbuch Arbeiten 4.0 und Arbeitszeitrecht: Neue Impulse für den Gesetzgeber' (2017) BB 1.

442 See <http://www.thefutureworldofwork.org/stories/uni-global/right-to-disconnect-uni-campaign/> (last accessed on 3 September 2024).

Without an express regulation like in the above-mentioned countries, the employer can regulate working hours and therefore the extent to which an employee is available in the framework of flextime.⁴⁴³ This does not apply, however, if fixed office hours are stipulated in the employment contract. In such cases, a more specific arrangement arising from the employment contract takes precedence. The availability of an executive employee, by contrast, can be stipulated under simpler circumstances or required subsequently.

Another idea would be **intelligent timekeeping** via an app. This allows employees to easily record those times when they receive phone calls or respond to an email outside of regular working hours. The matter can also be regulated optimally by way of a collective agreement. A *de minimis* regulation of ten to 15 minutes should be proposed in such agreements. Employers should also not specify fixed operating hours in employment contracts to allow subsequent changes.

III. Establish new social systems

Avoiding precarious labour conditions does not automatically mean higher minimum wages and more paid vacation days. The law needs to become more flexible and should support necessary digitalisation-related changes instead of prohibiting them. Owing to the increasing number of workers working below the social security threshold and the increasing numbers of self-employed workers, changing the social security system is regularly proposed. The latter group, in particular, often suffers from poor working conditions since national minimum wages do not apply to self-employed persons in the majority of European countries, and there is no right to either paid annual leave, continued payment of remuneration during illness, or comp time for overtime worked. However, statistics suggest that the level of atypical employment has been at a constant level of about 20 per cent in Europe and 40 per cent in the US.⁴⁴⁴ There is therefore no need to restrict these forms of work for the purpose of allegedly protecting those concerned. Instead, attractive **social security models** should be created. If this is not possible, the only way to fight potential poverty is to introduce a duty for self-employed individuals to pay into the social security system themselves, maybe together with mandatory contributions from the platforms.

Apart from the above-mentioned proposals to create a mandatory social contribution obligation for freelancers and especially crowdworkers, an **unconditional basic income** is a very common proposal all over the world.⁴⁴⁵ Discussions all over the world on how to finance such an idea focus mainly on

443 Besgen, 'Stress am Arbeitsplatz – Ständige Erreichbarkeit und Freizeitarbeit aus arbeitsrechtlicher Sicht' (2017) B+P 19 f.

444 See n 438 above.

445 See www.welt.de/wirtschaft/bilanz/article168595016/Ist-das-Grundeinkommen-die-Antwort-auf-den-digitalen-Arbeitsmarkt.html (last accessed on 3 September 2024).

taxes on robots⁴⁴⁶ or taxes on digital services. Whereas the European Commission has not made significant effort with regard to that issue in recent years,⁴⁴⁷ individual Member States like Austria and other countries like Mexico⁴⁴⁸ are focusing on the implementation of such a tax.

IV. Create an open-minded attitude toward AI

While **flexibility and adaptability to the changing reality in labour and employment law** would be desirable, most lawmakers have put little effort into adapting labour and employment laws to date. Until this situation has changed, one of the legal challenges will be how to make efficient use of existing technical possibilities and new business models in compliance with labour and employment law, and especially the strict European data protection law.

An **open-minded attitude** toward integrating AI into the day-to-day world of work can also be created by softening strict national data protection laws instead of just announcing 'leadership in AI' programmes. In European data protection law, numerous opening clauses allow for exceptions. As an example, 'automated decisions' by AI-based systems could be allowed inside existing employment relationships. Decisions on technical and annex competencies (eg, salary increases, bonuses) should be permissible, whereas AI should still not be allowed to take disciplinary actions (eg, dismissals, transfers or warnings). To ensure accountability of the system, its use could only be permissible if the following criteria are met:

- priority of human control;
- technical robustness and safety;
- protection of privacy and data quality;
- transparency;
- diversity, non-discrimination and fairness;
- social and ecological well-being; and
- accountability of the AI user.

The same applies for the admissibility of applicant screening. The specific **criteria for permissible applicant screening** in the future could be:

- basic permission of screening with reservations;

446 See www.cms-lawnow.com/ealerts/2018/05/artificial-intelligence-and-robotics-from-a-labour-and-tax-perspective-lawvolution?cc_lang=en (last accessed on 3 September 2024).

447 See www.tagesschau.de/thema/digitalsteuer/ (last accessed on 3 September 2024).

448 See www.gtai.de/de/trade/mexiko/recht/recht-kompakt-mexiko-577638 (last accessed on 22 October 2024).

- no discriminatory decisions;
- indication in the job description that AI is being used;
- informing the applicant what data are processed and how the AI-based algorithm works;
- always linking use of AI with consent;
- facilitation of the written form for consent (eg, digital signature or opt-in sufficient);
- obligation to delete the collected data after a maximum of 30 days; and
- ban on rejecting applicants who do not participate in AI-supported interviews.

V. Outlook

Since the last version of this report in 2017, a huge number of studies, technical innovations and economic development have taken place. While editing, many previously written chapters had to be revised, rewritten or deleted. This is indicative of the integration of digitalisation into the future labour market. What was valid yesterday may no longer be valid tomorrow.

However, it is hoped that legislators will try to respond to the digital trends with new laws. The support legislators have shown for (re)training in parallel with work gives hope that further innovative legislation will be adopted. Especially in Europe, based on numerous studies and ethical guidelines in dealing with AI, future laws are to be expected. Whether legislators can achieve the ambitious goals of being flexible remains to be seen.



the global voice of
the legal profession®

International Bar Association

Chancery House
53-64 Chancery Lane
London WC2A 1QS
United Kingdom
Tel: +44 (0)20 7842 0090
Fax: +44 (0)20 7842 0091
Email: editor@int-bar.org
www.ibanet.org