# Digital Horizons

A series of reports exploring CEE's digital future

**2022**

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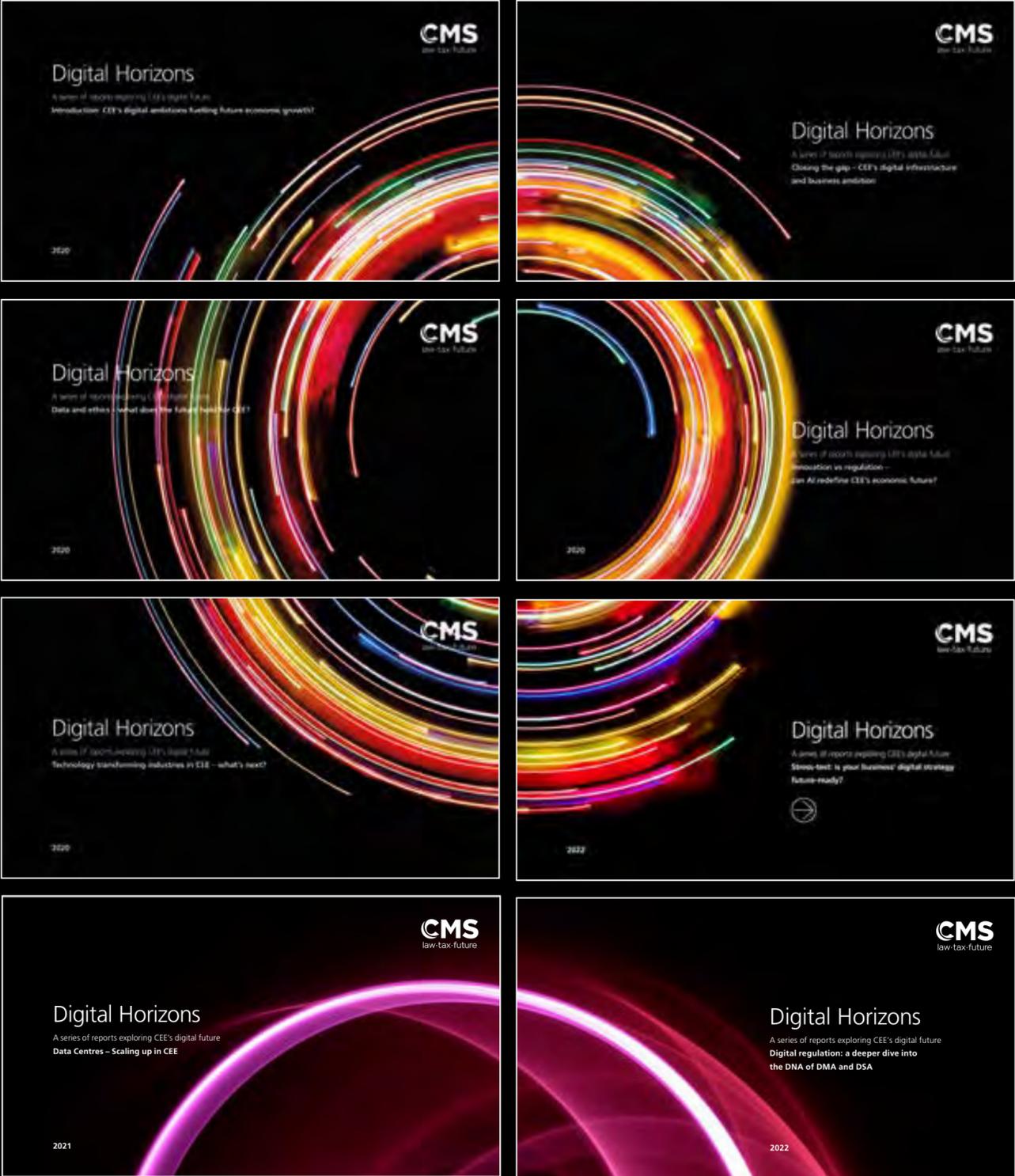
# Digital Horizons

A series of reports exploring CEE's digital future

**Digital regulation: a deeper dive into**

**the DNA of DMA and DSA**

**2022**

# Introduction
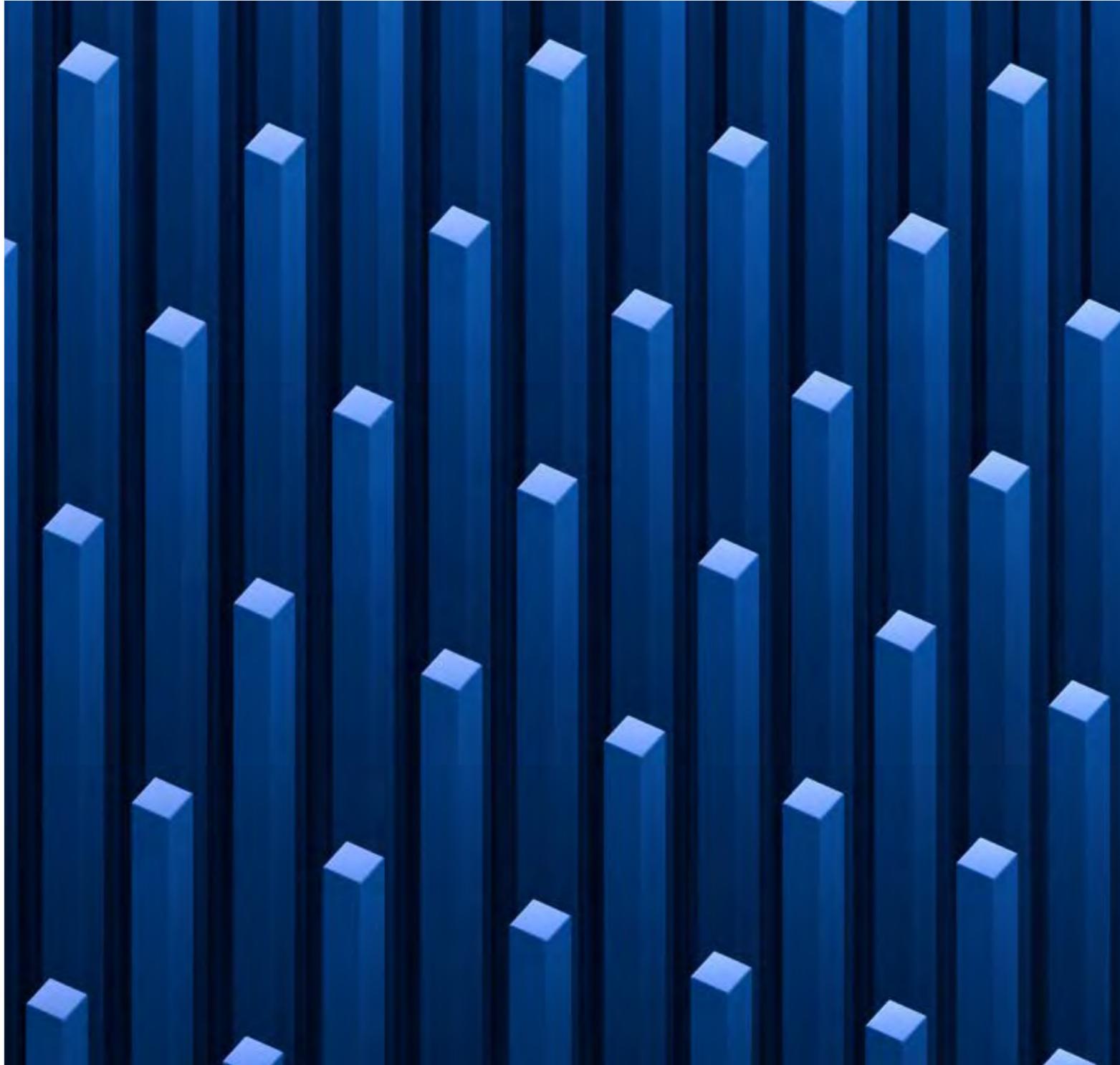
In keeping pace with the scope and scale of technology that affects its 450 million citizens, the European Union is at the forefront of implementing robust digital regulation.

Primarily, this is directed towards protecting consumers, ensuring fair competition and supporting innovation. In fulfilling these criteria, the Digital Services Package, consisting of the Digital Services Act (DSA) and the Digital Markets Act (DMA), was conceived in 2020 to regulate the digital space.

Together, these two Acts comprise a single set of new rules that will apply throughout the EU that are designed to create a safer and more open digital environment that protects users and establishes a level playing field for businesses.

Regulating everything from straightforward websites to internet infrastructure and online platforms, their stated objective is to foster innovation, growth and competitiveness, both in the European Single Market and globally.

By upgrading the current rules that govern digital services in the EU, they will also protect online users, establish governance with the protection of fundamental rights, and maintain a fair and open online platform environment across EU member states.

But despite sitting under the same digital umbrella, the DMA and DSA have distinctly different regulatory objectives: the DMA is intended to focus on the operation of digital platforms, while the DSA's broader scope creates obligations for digital services which act as intermediaries by connecting consumers with goods, services, and content.

Whereas the DMA is designed to ensure fairer digital markets by encouraging fair competition between digital suppliers, the DSA's focus is to ensure online safety and transparency for digital consumers. Both require significant attention from digital actors operating in the EU's tech space.

# Digital Markets Act

The Digital Markets Act has two overriding objectives: *"to ensure contestability and fairness for the markets in the digital sector in general"*. To address concerns about contestability and fairness, the DMA introduces assorted prohibitions and obligations on big tech companies that are designed to influence their commercial behaviour. *"The purpose of the DMA is to prevent the distortion of competition,"* says Marton Domokos, senior counsel at CMS.

Signed into law by the European Parliament and the Council of the EU in September 2022, it entered into force on 1 November 2022 and will become applicable on 2 May 2023.

The DMA only applies to companies that are designated as gatekeepers. According to objective criteria set out in the Act, these are big tech companies and major digital service providers: platforms that have a significant impact on the EU's internal market, serve as an important gateway for businesses to reach their end users, and which enjoy *"an entrenched and durable position."*

Under the DMA, gatekeepers are prohibited from certain activities, such as ranking their products ahead of competitors, pre-installing apps or software, and forcing consumers to use their other services. In the case of non-compliance, significant sanctions can be imposed by the European Commission (EC): fines of up to 10 per cent of a gatekeeper's worldwide turnover, and 20 per cent for repeat infringements.

*"The potential fines will get attract companies' attention, especially when they are linked to turnover. No matter how small a violation, the fine could be immense when you have billions of euros of turnover."*

**Olga Belyakova**
Partner, co-Head of TMT
in CEE, CMS

*"The purpose of the DMA is to prevent the distortion of competition,"*

**Marton Domokos**
Senior Counsel at CMS

# Gatekeepers

Gatekeepers are defined by the DMA as providers of core platform services (CPS) in digital markets – a status that the EC will ultimately determine. By virtue of the thresholds being applied, only the very largest tech companies will meet the relevant criteria.

The definition of a CPS includes everything from online intermediation services, online search engines and online social networking services to video-sharing platform services, number-independent interpersonal communications services; operating systems, web browsers, virtual assistants, cloud computing services and online advertising services provided with any of the aforementioned.

Three qualitative criteria must apply for a company to be considered as a gatekeeper for which there are corresponding quantitative thresholds:

— It must have a *"significant impact"* on the EU market. In practice, this means an EU turnover of €7.5 billion or above during the last three financial years; or an average market capitalisation (or equivalent fair market value) of at least €75 billion in the most recent financial year. It must also provide the same CPS in at least three EU Member States.

— Its CPS must be an *"important gateway"* between businesses and end users in the EU. This is judged to be 45 million monthly active end-users (representing 10% of the population of the EU) or 10,000 active business users, located or established in the EU.

— It must already have, or is soon likely to have, *"an entrenched and durable position"*, which is presumed to apply if the above user number thresholds were met in each of the last three financial years.

After the DMA begins to apply in May 2023, those CPS providers that meet these thresholds will have to submit notifications to the EC within two months. *"At present, the assumption is that we're going to have 15 to 20 companies within the DMA's scope - not only the big US tech giants, it's also going to affect European companies,"* says CMS competition partner Björn Herbers. Once designated as gatekeepers by the EC, they will then have six months to begin complying with the DMA obligations, summarised below, which is likely to be in March 2024.

*"At present, the assumption is that we're going to have 15 to 20 companies within the DMA's scope - not only the big US tech giants, it's also going to affect European companies"*

**Björn Herbers**
Partner, Competition, CMS

# Obligations and prohibitions
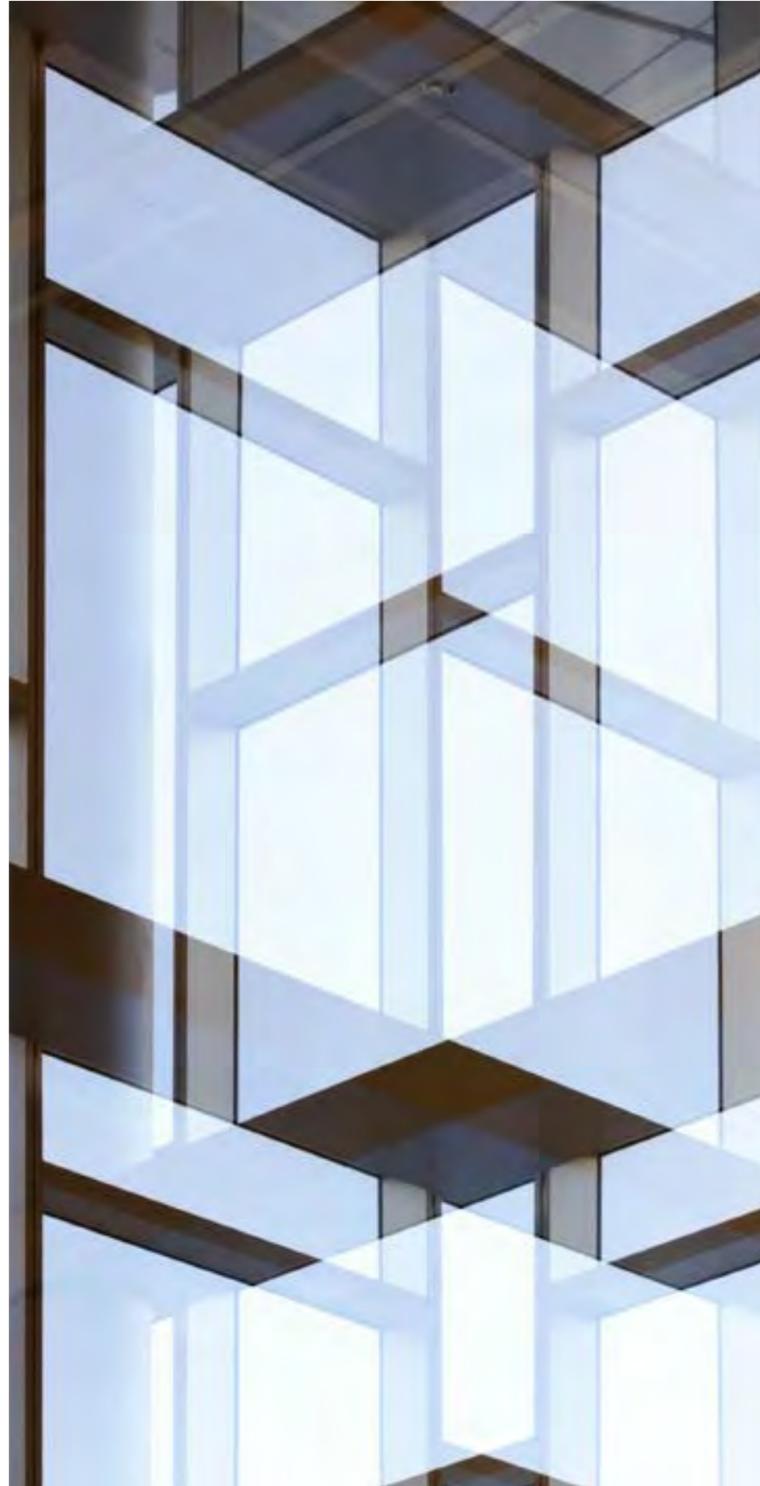
Under the DMA, the wide-ranging set of obligations and prohibitions relating to each CPS will have a significant impact on how they will be required to manage their products and services. To a considerable extent, these reflect the decisions of recent competition law infringement cases.

Compliance with these obligations and prohibitions will invariably affect multiple aspects of what gatekeepers do: restricting how they can deploy user data, requiring them to make messenger services concerning basic functionalities interoperable with third parties, and obliging them to provide information to advertisers and publishers.

The DMA provides two distinct categories of obligation and prohibition for gatekeepers. Under the first category, they can comply without the EC having to provide any more information. Under the second category, defined as those "susceptible to be further specified", the EC can provide judgment on whether a gatekeeper's proposed method of meeting an obligation will suffice, or if it needs to be enhanced.

## The first category includes:

— **Use of personal data:** not processing for online advertising purposes the personal data of end-users (without their consent) of third-party services supplied through the gatekeeper's platform;

— **Use of business data:** not combining or cross-using end-users' personal data (without their consent) across or between CPS and other services or sign-in end-users to other services to combine personal data;

— **Most-Favoured-Nation (MFN) clauses:** not imposing either 'wide' or 'narrow' parity, the DMA prohibits wide and narrow (MFN) clauses - restricting business users from offering lower prices and better conditions on any other online or their own sales channels.

— **Interoperability:** gatekeepers must allow services and hardware providers with interoperability with hardware and software features accessed or controlled via its operating system or virtual assistant, and ensure interoperability for number-independent interpersonal communications services to its designated service.

Business users will be allowed, free of charge, to communicate and promote their products and services to end users acquired via the gatekeeper's CPS (or other channels) and to agree contracts with those end-users. Via the gatekeeper's CPS, end-users will be allowed to access and use content, subscriptions, features or other items by using the software application of a business user, including those acquired outside of the gatekeeper's CPS.

Gatekeepers will also have to provide (on request and free of charge) a list of advertisers and publishers to which they supply online advertising services daily information concerning the price and fees paid by the advertiser and publisher, the remuneration paid to the publisher, and how these figures are calculated.

Notable among the more far-reaching obligations in the second category are those that will allow users to download apps from the Internet and third-party app stores and enable developers to use their chosen in-app payment solution and promote offers to app users, and the requirement to offer access to the app store on fair, reasonable and non-discriminatory (FRAND) terms.

# DMA Impact

Compliance with the DMA will compel big tech companies to make changes to their business model. Some have already begun the process. Gatekeepers will have to report measures that they have implemented to the EC, ensuring compliance with the DMA's obligations and establishing a compliance function that is independent from their operational functions.

The EC plans to adopt an implementing regulation in Q1 2023 that will deliver greater clarity on the DMA's requirements and procedural aspects, including the notifications of gatekeeper status and measures that should be adopted by gatekeepers to ensure compliance with obligations.

In common with the response to the GDPR, which became effective in May 2018, the DMA may lead to changes in how big tech platforms serve customers beyond the EU since some aspects of compliance are more easily implemented on a global basis. Equally, given its potential impact on the operation of designated gatekeepers, it is anticipated that some aspects of the DMA may become subject to legal challenges.

Either way, the DMA marks a very significant regulatory step by the EU and a major hurdle to overcome for big tech companies that are designated by the EC as gatekeepers.
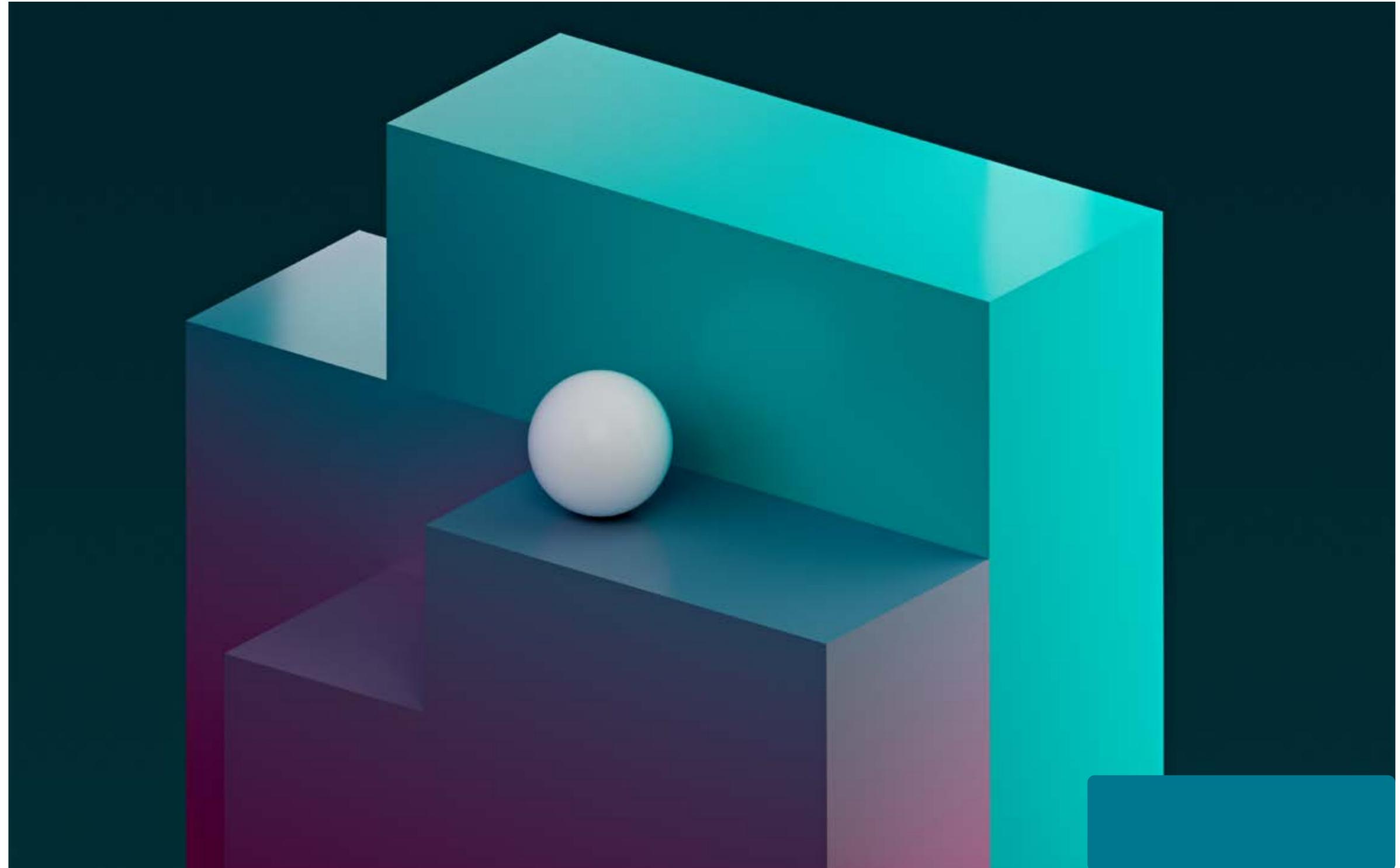
# Digital Services Act

**"The DSA's overarching principle is consumer protection. Whenever you read something in the DSA, you always have to bear in mind: this is meant to protect consumers. The DSA's rules should therefore be interpreted in a way that is consumer friendly."**

**Dóra Petrányi**
CEE Managing Director, Global Co-Head of the Technology, Media and Communications Group (TMC), CMS

Described by some commentators as the EU's new digital constitution, the Digital Services Act (DSA) is the second strand of the EU's Digital Services Package. *"The DSA's overarching principle is consumer protection. Whenever you read something in the DSA, you always have to bear in mind: this is meant to protect consumers. The DSA's rules should therefore be interpreted in a way that is consumer friendly."* says Dora Petranyi, Global Co-Head of the TMC group at CMS.

Sitting alongside its sister regulation the DMA, the DSA outlines the responsibilities of intermediary service providers (ISPs) that provide access to goods, services and content. The DSA will *"harmonise the rules that apply in the online digital world within the EU, and possibly impact beyond the EU's borders,"* says Arne Schmieke, senior associate at CMS. *"So, for any operator located outside, but who offers its services or goods for consumers within the EU, they will also have to respect the rules."*

The DSA builds upon the existing e-Commerce Directive that was first adopted in 2000, ensuring greater accountability in how online ISPs operating in the EU moderate content, advertise, and utilise algorithmic processes. In doing so, it aims to create clear, harmonised rules for digital services, addressing illegal and harmful online content, while protecting digital innovation and free expression. *"Under the DSA, the Internal Market will work in a unique and unified way, because up until now Member States have interpreted the e-Commerce Directive in very different ways,"* says Katalin Horváth, senior counsel at CMS.

The DSA was published in the Official Journal of the EU on 27 October 2022 and entered into force on 17 November (20 days after publication). Most of its provisions will take effect in February 2024. It applies to digital services providers, including those based outside the EU which offer services to users in EU member states. In this extra-territorial scope, ISPs that are not established in the EU will have to appoint a designated legal representative in the EU who can be held liable for non-compliance with DSA obligations.

Although most companies will have until 17 February 2024, the biggest companies will have to act sooner. Very large online platforms (VLOPs) and very large online search engines (VLOSEs) will have to comply with their obligations four months after their designation by the EC. This will be determined by the number of users reported by VLOPs and VLOSEs - information they will have to provide to the EC by February 2023. At that point, the enforcement process will start to be implemented.

# Digital Services Act

## Categories

The DSA outlines basic obligations that will apply to all online ISPs, while the most burdensome will apply to the biggest companies. Four categories are defined:

| | |
|---|---|
| CATEGORY 1 | ISPs: online services that are either a "mere conduit" service, a "caching" service, or a "hosting" service. This would include online search engines, wireless local area networks, cloud infrastructure services, and content delivery networks. |
| CATEGORY 2 | Hosting services: ISPs which store information at the service user's request, such as cloud services and services that enable sharing information and content online, including file storage and sharing. |
| CATEGORY 3 | Online Platforms: hosting services that disseminate information which they store to the public at the user's request. Examples include social media platforms, app stores, message boards, online forums and marketplaces, metaverse platforms, as well as travel and accommodation platforms. |
| CATEGORY 4 | VLOPs and VLOSEs that have more than 45 million active monthly users in the EU. |

## Obligations

Under the DSA, the exact range of obligations applying to individual ISPs will depend on the category that applies to each of them.

Some compliance obligations apply to all ISPs:

| | |
|---|---|
| Transparency Reporting | they must publish annual transparency reports on their content moderation activities. This should include measures taken to apply and enforce their terms and conditions. |
| Terms and Conditions: | T&Cs relating to content moderation practices must be clear and provide easily accessible information on the right to terminate the use of their services. |
| Official Orders: | on receipt of an order either to act against illegal content or to provide information, they must inform the relevant supervisory authority of any follow up, specifying if and when they did so. |
| Single Point of Contact: | they must designate a single electronic point of contact for official communication with EU supervisory authorities and recipients of their services. |

## Obligations for ISPs in Categories 2-4:

| | |
|---|---|
| Notice & Action Mechanisms: | they must implement these mechanisms for content that users consider to be illegal. Content that targets victims of cyber violence must be removed "immediately", while other content deemed illegal must be removed "swiftly". |
| Statement of Reasons: | they must provide users with a statement of reasons whenever they delete or block access to their content for moderation purposes, when they restrict payments, or suspend or terminate their own service or the user's account. |
| Reporting Criminal Offences: | they must notify national law enforcement or judicial authorities if they suspect any serious criminal offences may have been committed. |
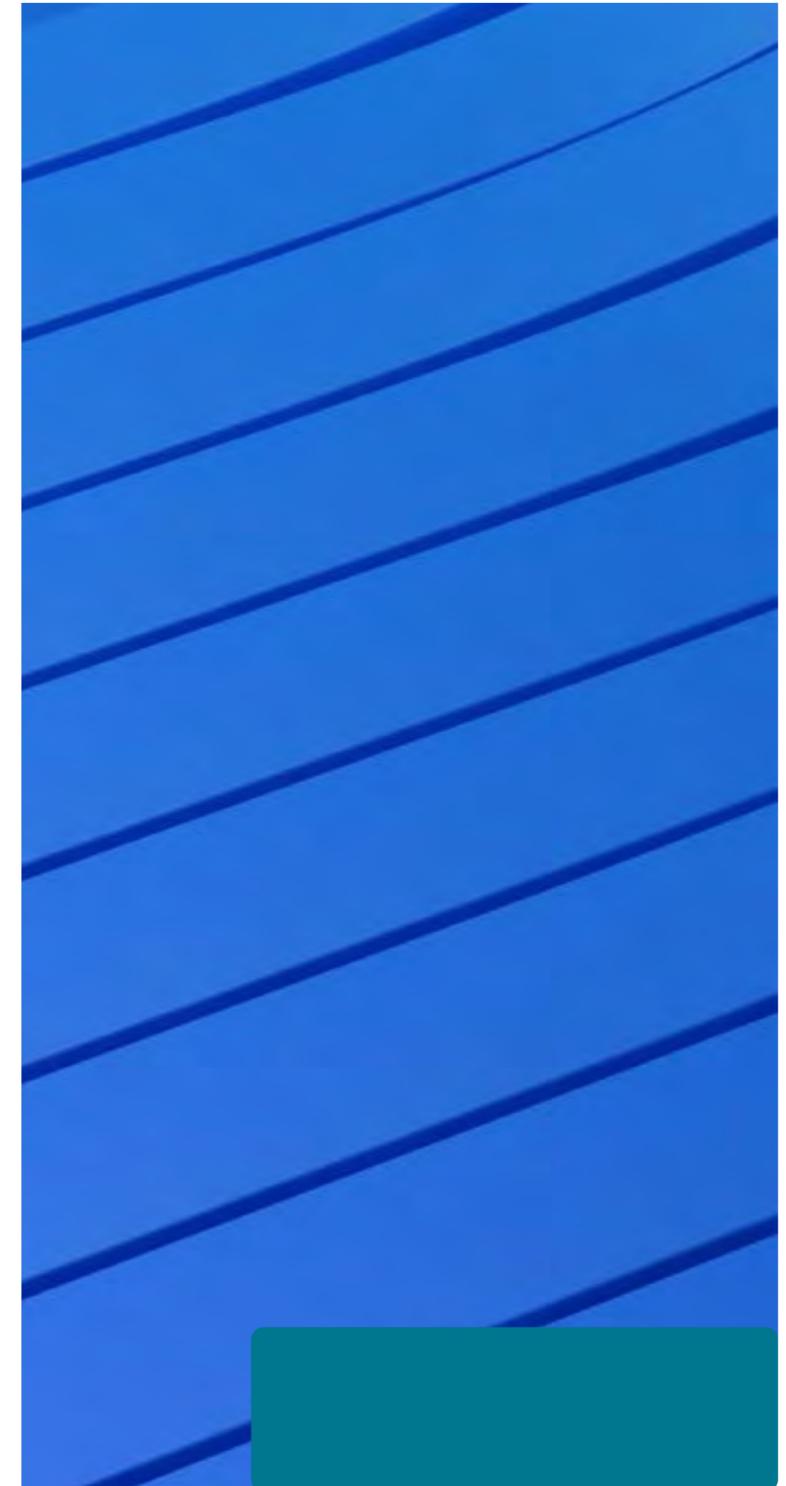
# Digital Services Act

| Obligations for ISPs in Categories 3-4: | |
| --- | --- |
| Complaint & Redress Mechanism: | Users have new rights of redress - a right to complain to the platform, seek out-of-court settlements, complain to their national authority in their own language, or seek compensation for any damage or loss suffered due to an infringement of the DSA. |
| Trusted Flaggers: | Platforms must cooperate with designated 'trusted flaggers' to identify and remove illegal content, which includes any information that in itself or in relation to an activity, is not compliant with EU or Member State law. |
| Bans on Targeted Advertising: | Targeted advertising is significantly curtailed. This includes a ban on targeted advertising to children and those based on special categories of personal data - ethnicity; political views; sexual orientation; religion, or genetic or biometric data. |
| Advertising Transparency: | This includes a requirement to include meaningful information on why a user was targeted with a particular advertisement. |
| Recommender Systems: | ISPs that use recommender systems must outline in their T&Cs the main parameters that determine how they suggest or prioritise information, and any options for users to modify or influence these parameters. |
| Protection of Minors: | ISPs must implement "appropriate and proportionate measures" to ensure a high level of privacy, safety, and security of minors. |
| Interface Design: | A ban on Dark Patterns - designs that manipulate users into making choices they did not intend. This extends to targeted advertising that nudges users to purchase certain goods, or in recommender systems which use cognitive traits to present content designed to keep users on a platform for as long as possible. |
| Traceability of Traders: | If ISPs enable consumers to conclude contracts with traders (online marketplaces), they must ensure their traceability by collecting and assessing the veracity of basic trader information. If the platform becomes aware of an illegal product or service being offered, it must inform affected consumers. |

*"The DSA will harmonise the rules that apply in the online digital world within the EU, and possibly impact beyond the EU's borders. For any operator located outside, but who offers its services or goods for consumers within the EU, they will also have to respect the rules."*

**Arne Schmieke**
Senior Associate at CMS

# Digital Services Act

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**Katalin Horváth**
Senior Counsel at CMS

## VLOPs and VLOSEs

The strictest rules apply for VLOPs and VLOSEs. Their additional obligations include:

| | |
|---|---|
| Audits: | They will be subject to enhanced transparency obligations, including paying for annual independent audits to assess their compliance with DSA obligations. |
| Annual Risk Assessments: | these must be undertaken and risk mitigation measures implemented regarding any systemic risks, including the dissemination of illegal content and negative effects on fundamental rights. |
| Compliance function: | they must establish an independent internal compliance function that reports directly to the board, comprised of suitably qualified professionals who are adequately trained. This is comparable to the Data Protection Officer role under the GDPR. |
| Data access & scrutiny: | they must provide regulators with access to any necessary data for assessing their DSA compliance. At the regulator's request, they must also provide vetted researchers with access to certain data to understand how online risks evolve. |
| Additional advertising transparency | they must provide a repository, where recipients can access information on online advertising displayed within the last year. This includes the content of the online advertisement, its principal, period and target groups - a potentially significant challenge to the protection of trade secrets. |
| Crisis Response Cooperation: | they must implement a crisis response mechanism and follow EC directions concerning specific actions on content during social and political emergencies. |
| Recommender systems: | VLOPs must provide users with at least one recommender system option that is not based on profiling. |

## Enforcement

Each Member State will designate a Digital Services Co-ordinator (DSC) to ensure supervision and enforcement of the DSA. Under the DSA, a new European oversight and advisory entity, the European Board for Digital Services (EBDS), will be comprised of national DSCs. The EBDS will be chaired by the EC, which has exclusive powers to supervise and enforce obligations that only apply to VLOPs.

# Preparing for the DSA and DMA

Businesses whose services may be broadly defined as ISPs should assess their services against the DSA and DMA definitions and comply with obligations concerning the designation of points of contact, legal representatives and compliance officers. More broadly, a strategic review of governance processes, documents, tools and interfaces should be undertaken in relation to the DSA and DMA obligations relating to content, format and accessibility, as well as new requirements for notification tools for illegal content and content moderation decisions, for example.

Assorted technical issues, such as dark patterns, also have specific new requirements. *"Companies must be able to document that they have taken care to avoid dark patterns in the development phase - this is the general principle,"* says Domokos.

Preparing for such new requirements will require significant effort and investment, underpinned by technical and legal capability at every stage.

# Stress-test: DMA and DSA
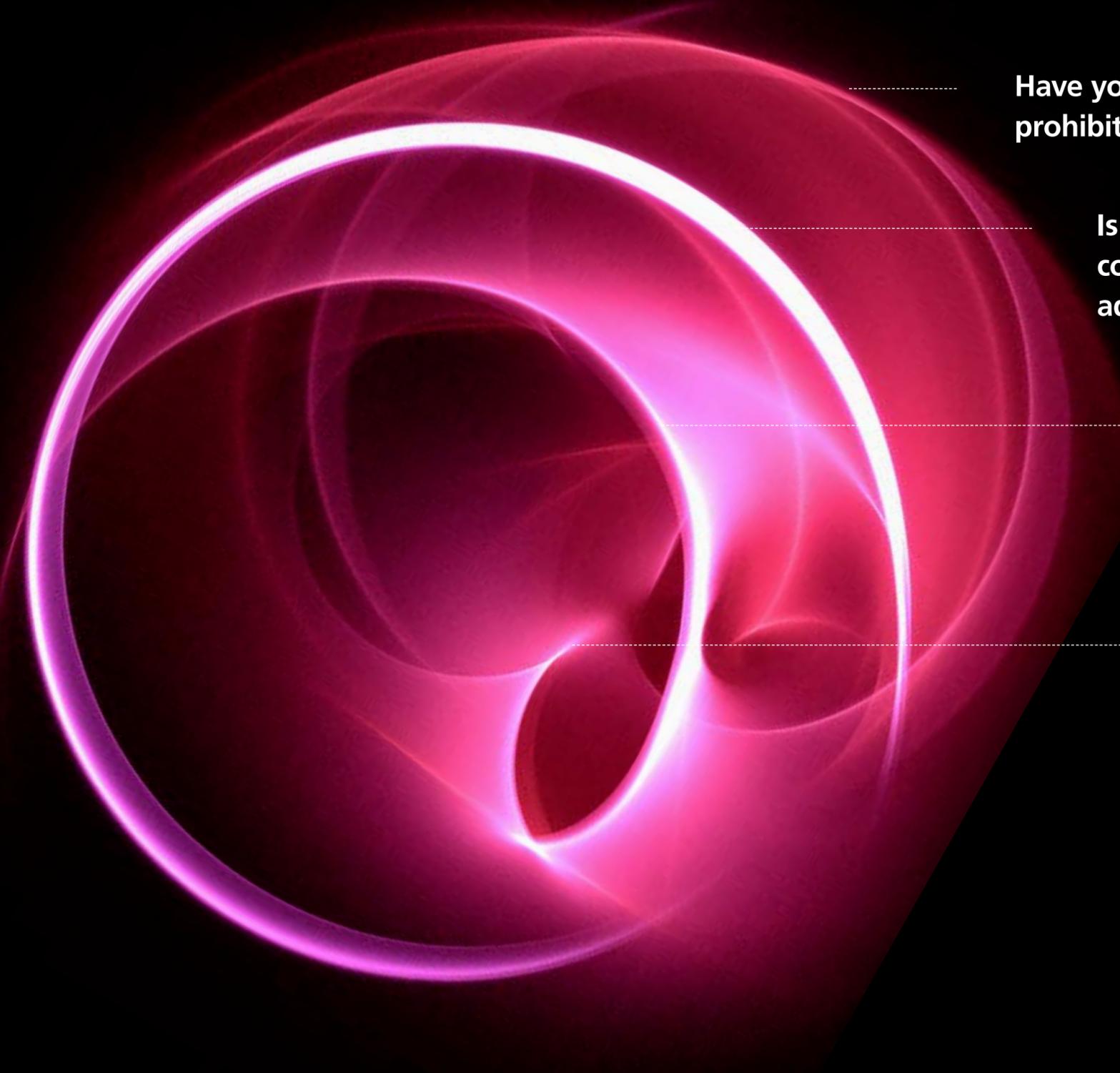
**Have you taken all necessary steps to comply with obligations and prohibitions outlined by the EU's Digital Services package?**

**Is your team aware of the impact of the Digital Services Act affecting your company's online advertising? Did you think about changes to your current advertising policies?**

**Will increased enforcement against dark patterns lead to significant changes in your platform design?**

**In response to the Digital Markets Act, how do you anticipate increasing innovation and the quality of your online services?**

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**Data Centres – Scaling up in CEE**

**2021**
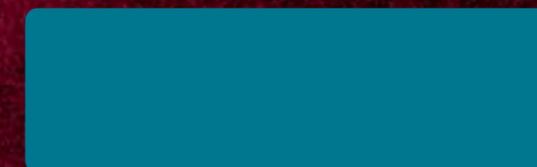
# Introduction

*"Everything depends on local regulations: that's why in some CEE countries there are more data centres than elsewhere"*

**Olga Belyakova**
Partner, co-Head of TMT in CEE, CMS

*"Thanks to EU harmonisation, you have very transparent and predictable legal systems in CEE, with favourable tax regimes in some countries"*

**Eva Talmacsi**
Partner, co-Head of TMT in CEE, CMS

The world needs more data centres: that much is evident from the projected growth in data generation. Last year, the volume of data created, captured, copied, and consumed worldwide was c.64Zb – a figure that is anticipated to grow to c.180Zb by 2025. Inevitably, big companies operating in Europe will need more data centres to house the increasing volumes of valuable data which they hold. In terms of cost, incentives and access to skilled labour, CEE provides significant opportunities for these companies to build safe, secure and cost-effective data centres in a multiplicity of locations across the region.

*"Everything depends on local regulations: that's why in some CEE countries there are more data centres than elsewhere,"* says Olga Belyakova, CMS partner and co-Head of TMT in CEE. *"This is often connected to factors such as local rules for construction procedures, energy generation and telecom infrastructure."*

From an investment perspective, CEE-based data centres - including new internet provision and HVAC systems - are equally attractive: they provide stable revenues since operators generally sign long leases and rarely relocate because of significant upfront costs and the inherent risk of data loss during migration. Accordingly, data centres are becoming a key part of commercial real estate development across CEE, a phenomenon which has been accelerated by the Covid-19 pandemic.

*"Thanks to EU harmonisation, you have very transparent and predictable legal systems in CEE, with favourable tax regimes in some countries,"* says Eva Talmacsi, Co-Head of the CEE TMT Practice at CMS. "There is an exponentially growing demand from various companies operating in Europe, which are not necessarily based in CEE, but their data centres could be."

# CEE digitalisation

The revolution in data centre development coincides with big companies and national governments escalating the speed and scale of their technological transformation. Governmental commitment to digital infrastructure has enabled the development of solid broadband infrastructure. According to McKinsey Research, CEE's digital economy grew by almost 8% a year between 2017 and 2019 – nearly double the equivalent in the major economies of Western Europe.

Acceleration of a digital, tech-driven economy is seen as pivotal to post-pandemic growth across the region. So too is the pressure to incorporate sustainability into new buildings, such as data centres. According to Talmacsi, future-proofing digital infrastructure is a high priority for regulators and businesses alike. Citing Netflix's commitment to achieve net zero emissions by the end of 2022, she identifies *"a very positive trend of both infrastructure providers and end users embracing the need to think about zero-emissions and a sustainable future."*

Together, the confluence of multi-Cloud and Big Data strategies, the move towards 5G, and the increased industrial use of AI and smart city initiatives are fuelling demand for data centre companies. As new data centre locations appear, tech companies are focusing on European capitals. Among CEE hubs, Warsaw takes the lead. Internet usage in the region is already high. While 47% of people in the EU looked up information on public authority websites last year, for example, three CEE countries were above average: Hungary 60%, the Czech Republic 53% and Slovakia 51%.

In bridging the technological gap with Western Europe, corporate expenditure on digitalisation in CEE continues to rise with large IT companies reporting strong demand. For example, CEE's largest local software company, Asseco, saw its project pipeline grow by 25% last year. Across the EU, 36% of companies use Cloud services. In CEE, the Czech Republic ranks highest (29%), followed by Slovakia (26%), Hungary (25%) and Poland (24%). Comparable figures for Big Data technologies show that 14% of EU companies use them. The Czech Republic, Poland, Hungary and Slovakia, where the figures are 9%, 8%, 7%, and 6%, respectively, are expected to catch up with the rest of the EU over the next few years.

## Cloud Services and Big Data technologies

*What percentage of companies use cloud services and big data technologies in European countries?*
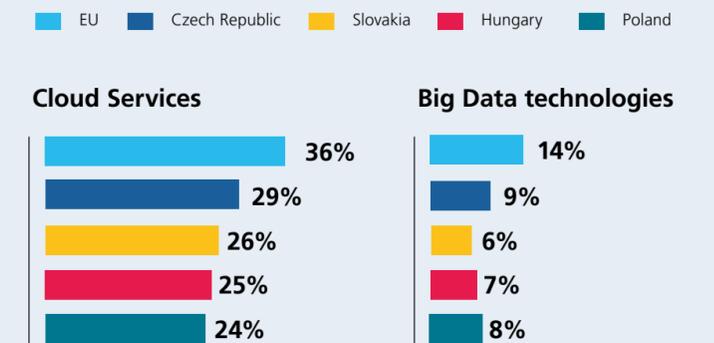
■ EU ■ Czech Republic ■ Slovakia ■ Hungary ■ Poland

**Cloud Services**

- 36%
- 29%
- 26%
- 25%
- 24%

**Big Data technologies**

- 14%
- 9%
- 6%
- 7%
- 8%

*"a very positive trend of both infrastructure providers and end users embracing the need to think about zero-emissions and a sustainable future."*

**Eva Talmacsi**
Partner, co-Head of TMT in CEE, CMS

# CEE - Multinational hubs



*"Over the past two years, there has been an expansion of major players in the data centre market and in developers, specifically in Poland"*

**Tomasz Łosek**
Head of Data Centres, Turner & Townsend

Throughout CEE, there has also been an increase in supply requirements from hosting, managed service and Internet service providers. During the COVID-19 pandemic, many operators saw a surge in demand from existing customers in these subsectors seeking to expand their footprint to meet increasing enterprise demand.

*"Over the past two years, there has been an expansion of major players in the data centre market and in developers, specifically in Poland,"* says Tomasz Łosek, Head of Data Centres at Turner & Townsend in Poland. *"These are hyperscalers - big players in the data market. Effectively there are three big ones: Google, Microsoft and Amazon Website Services."* Cybersecurity providers are critical in the operation of such data centres: CEE's strong reputation in this area helps to make the region a preferred client choice.

Other major end users across CEE include the ICT, finance, insurance, and utility sectors, as well as public administrations. Financial sector companies that have already located their tech hubs in Poland, for example, include ING, UBS, Morgan Stanley and Credit Suisse. Key investors in the CEE Data Centre space include: Equinix, Conova Communications, IXcellerate, Interxion, Boosteroid, 3data, DataPro, Host-telecom.com, and CEZ Group. Global tech giants have also announced plans to open a major data centre and cloud hub, respectively in the region.

# EU's Digital Europe programme

Recognising that digital transition will underpin its future prosperity, the EU plans to increase funding to support digital investments. In the Multi-annual Financial Framework, part of the long-term EU budget, the Commission has proposed a Digital Europe programme to accelerate post-COVID-19 recovery and drive the EU's digital transformation. *'The Digital Europe programme will boost investment in supercomputing, AI, cybersecurity, advanced digital skills, and ensure the widespread use of digital technologies, including through digital innovation hubs.'* says Dóra Petrányi, CEE Managing Director, Head of TMT, Hungary at CMS.

To realise this, building capacity for new digital technologies will be augmented to support digital transformation that will benefit people and businesses. With a budget of €7.58 billion, the Digital Europe programme will run from 2021 to 2027, complementing other EU programmes, such as the Horizon Europe programme for research and innovation, and the Connecting Europe Facility, which focuses on digital infrastructure.

*"The Digital Europe programme will boost investment in supercomputing, AI, cybersecurity, advanced digital skills, and ensure the widespread use of digital technologies, including through digital innovation hubs."*

**Dóra Petrányi**
Partner, CEE Managing Director, CMS

# Key investment factors

## Incentives

To ensure that enterprises can compete on equal terms in the markets of all member states, it is generally prohibited under EU law to grant any kind of incentive that may affect competition and trade between them. But there are exceptions to this general rule. These allow the granting of aid for R&D, training, the creation of employment and environmental protection, the development of certain business areas of activities (sectoral aid), and regional aid to promote economic development in areas where the standard of living is very low compared to the EU average.

Since many CEE countries are less economically developed than their Western European counterparts, aid is often permissible to encourage development within designated regions. Accordingly, investment grants are available in some CEE countries, such as the Czech Republic, Poland, Bulgaria, and Slovakia. To varying degrees, corporate income tax reliefs can be applied while cash grant schemes for priority areas can cover salary costs in regional development which promotes job creation.

## Energy supply

Energy is critical in data centre operation. *"Data centres are energy intensive users,"* says Piotr Ciołkowski, Energy and Projects partner at CMS Poland. Typically, a dry storage warehouse will require around 50kW of electricity per 1000 sqm, whereas an average data centre of comparable size and a standard number of servers requires around 2MW - 40 times as much. Because data centres operate continuously, they must be safeguarded against power or internet outages, and voltage spikes. To mitigate these risks, more than one source of both electricity and fibre optic internet provision are necessary.

In case of network failure, separate systems for each internet provider are also imperative.

Barriers to the free flow of non-personal data between member states have recently been removed under EU law. In this context, Poland is well-positioned as a potential European data hub: it has the second-lowest corporate electricity prices in the EU while a planned pipeline to Norway, which will improve the country's energy security, is likely to attract more companies that offer cloud services to Poland from across Europe. Benefiting from relatively low construction costs and land prices, Poland is also undergoing significant improvement in its transport and digital infrastructure. Together with a pool of skilled domestic IT labour, this further adds to its investment appeal.

## Tax Benefits

Corporate income tax (CIT) rates vary widely across the EU. In a competitive tax environment, several CEE countries offer low rates to attract foreign investment. Notably, four of the five EU countries with corporate tax rates below the EU average of 20.7% are in CEE: Hungary has the lowest rate at 9%, followed by Romania, 16%, and the Czech Republic and Poland, both 19%.

To encourage investment, many countries are also seeking to introduce measures which favour reinvestment of profit, so that tax collection is shifted to the point when a company distributes profits to shareholders. This system supports reinvesting earnings and has simplified tax accounting requirements. In 2021, Poland became the first country to introduce thus tax regulation in the CEE region.



*"Data centres are energy intensive users"*

**Piotr Ciołkowski**
Partner, Energy and Projects, CMS

# Key investment factors

**Skilled Labour**

Big multinationals already use CEE as a major hub for back-office process outsourcing. They rightly perceive CEE as a good place to locate their R&D, technological and operational centres with access to an abundance of highly skilled local programmers and ICT employees who are more than a match for other labour markets. Critically, Eurostat data from 2019 shows that labour costs in CEE are up to 70% lower than equivalent rates in Western Europe. Łosek points to the availability of a skilled workforce at moderate costs. *"We have a relatively high number of young educated people, whose salary demand is below the level of Western Europe, but who provide equivalent services to Western Europe,"* he says.

**Real Estate**

The increasing volume of data that needs to be managed, stored and controlled is driving the construction of new data centres to meet demand. For the real estate sector, this provides significant potential. Data centres are set to see strong growth, according to a recent report from global commercial real estate company CBRE. *"There is a lot of interest in data centres from large construction companies, who find that traditional areas like the office or retail market is shrinking, stagnating,'* notes Łosek. *"They are looking at switching to provide the infrastructure."*

Lukas Hejduk, Head of CEE Real Estate and Construction at CMS in Prague, adds: *"Data centres are mushrooming across CEE, especially in Poland, followed by the Czech Republic,"* he says. *"They are typically long-term, triple net leases, which means that the landlord is able to recover their costs very easily: all expenses including taxes, insurance and maintenance are covered by the tenant. Data centres are emerging as a new sector and are already attracting investors' interest. There is a lot of development. A number of operators use data centres as co-location centres, renting out space to other companies."*

**Conclusion**

Fuelled by strong demand that is anticipated to grow further, the outlook for data centres across CEE remains very buoyant. This is underpinned by a range of beneficial factors: a secure and well-developed digital infrastructure, supportive national governments, a range of EU incentives, access to a pool of highly skilled IT labour with distinct cost advantages, reliable energy sources, and access to real estate that enables and supports hybrid digital infrastructures.

*"There is a lot of interest in data centres from large construction companies, who find that traditional areas like the office or retail market is shrinking, stagnating"*

**Tomasz Łosek**
Head of Data Centres, Turner & Townsend

*"Data centres are mushrooming across CEE, especially in Poland, followed by the Czech Republic"*

**Lukas Hejduk**
Partner, Head of CEE Real Estate Practice, CMS

# Digital Horizons

A series of reports exploring CEE's digital future

**Introduction: CEE's digital ambitions fuelling future economic growth?**

CMS
law·tax·future

2020

# Data highlights
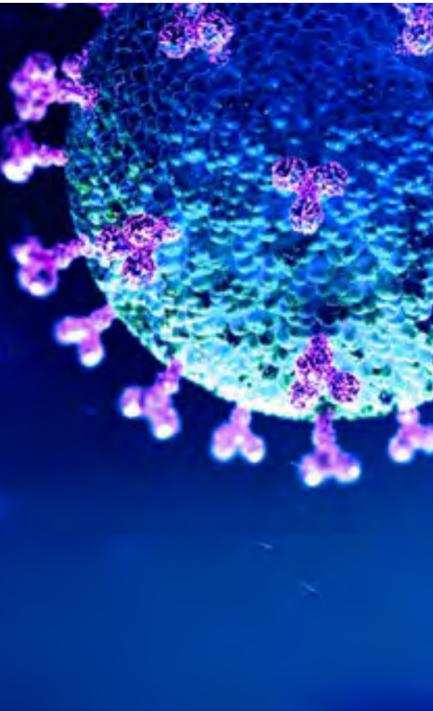
## 92%
**believe that the pandemic will accelerate future digital change in their business**

Response to the pandemic is radically shifting the pace of digitalisation

## 56%
**see the public sector making some progress in digitalisation**

Governments need to embrace digitalisation more to ease the bureaucratic burden

## 86%
**are worried about AI legal liability issues**

Response to the pandemic is radically shifting the pace of digitalisation

## 58%
**already use AI solutions**

The benefits of cost and efficiency are driving businesses to use AI

## 65%
**plan to increase their IT budget next year to invest in digitalisation**

Most companies anticipate the need to commit greater resources to digital

## 98%
**consider ethics as part of their current guidelines and policies**

Safeguarding data, considering the human cost and making decisions based on brand values are key

# CEE's digital ambitions fuelling future economic growth?



*"Organisations often confuse digitisation with digital transformation"*

**Amit Joshi**,
Professor of AI, Analytics and Marketing Strategy, IMD Business School

As the volume of data generated by commercial activity continues to grow at an exponential rate, a digital transformation of the global economy is well underway. For the countries in CEE, which has already become one of the most attractive regions in which to invest, it will deliver up to EUR 200bn in additional GDP by 2025, according to McKinsey. This will create an economic boost for companies operating in CEE and increase prosperity for the 150 million people who live and work there.

So what is digital transformation? Amit Joshi, Professor of AI, Analytics and Marketing Strategy at IMD, notes that *'organisations often confuse digitisation - an analogue or manual process which is converted to digital - with digital transformation.'* What digitisation does, he explains, is to create lots of data, whereas digital transformation uses that data to transform business activities, processes and products to maximise and monetise the opportunities which are provided by digital technologies.

As well as opportunities, there are also risks. Prudent businesses recognise the complexities of digital transformation rather than making assumptions that it is risk free.

Strategically, as they seek to develop the enormous commercial potential of technologies that depend upon the newly created digital infrastructure, they have to strike a balance by satisfying regulatory compliance obligations and maintaining vigilant corporate governance in how they manage the enormous volumes of data at their disposal.

To make the most of digital technology, the need for immediate, smooth connectivity is also having considerable repercussions on corporate strategy. In some cases, much has already been achieved. *'Over several years, we have undertaken very heavy investment in digitalisation development across CEE,'* says András Fischer, Head of Innovation at OTP Bank.

Evaluating the impact of new digital solutions can be challenging, notes Kamil Šebesta, Legal Director, Medical Devices Group at Johnson & Johnson, *'When it comes to new technologies, it may be difficult to predict all the risks, but we never compromise on patient safety and compliance,'* he says.

# Pandemic accelerating change

The growing influence of digital technology is further evident from a survey conducted by CMS of nearly 100 participants across the CEE region. Drawn from a broad range of sectors including financial services, TMT, manufacturing, life sciences, consumer products and energy, 65% of respondents see digitalisation as a priority in realising their immediate business goals. Most believe that it will reduce costs, making their operations more productive and more competitive.

Although the digital trend started well before Covid-19 appeared, the dramatic global response to the pandemic has clearly acted as a further spur in the digital agenda of multiple CEE businesses: 38% of respondents have completed or initiated new projects as a result while 45% say that it has served to accelerate ongoing projects. Notably, 92% (46% very much; 46% somewhat) believe that the pandemic will accelerate future digital change in their business.

One example is the increased prevalence of e-signatures for commercial contracts and corporate documents. Three quarters of survey respondents anticipate that IT budgets will be enlarged next year to support digitalisation with 40% of them expecting a double-digit increase. They highlight financial services and life sciences as the standout sectors in which digitalisation will be most driven by the fallout from the pandemic, followed by manufacturing, automotive and energy.

*'With Covid, all digital activities have expanded because of the pressure to look for efficiencies using digital tools,'* says David Kozák, General Counsel EMEAI at Honeywell. *'In terms of customers, not only for us, but also for other companies,'* adds Markus Fleischer, who is responsible for Corporate Development at A1 Digital, *'Covid has provided evidence of which digital services deliver value.'*

In many CEE countries, existing high-quality digital infrastructure is already boosting the levels of e-commerce and online banking activity: 4G coverage is excellent, ultrafast broadband is commonplace and affordable for most citizens, while the CEE region benefits from one of the world's highest contactless-payment adoption rates.

*'We have Industry 4.0: smart offices, smart factories and production lines, where digital infrastructure is the base of operations,'* says Dóra Petrányi, CEE Managing Director, Head of TMT, Hungary at CMS. *'It's no longer just financial services and telecoms.'*

## Three quarters of survey respondents anticipate that IT budgets will be enlarged next year to support digitalisation

*By how much will your IT budget increase next year to support / invest in digitalisation?*

- 1%
- 9%
- 24%
- 32%
- 34%

Legend:
- Above 20%
- 10-20%
- 0-10%
- No change
- Decrease
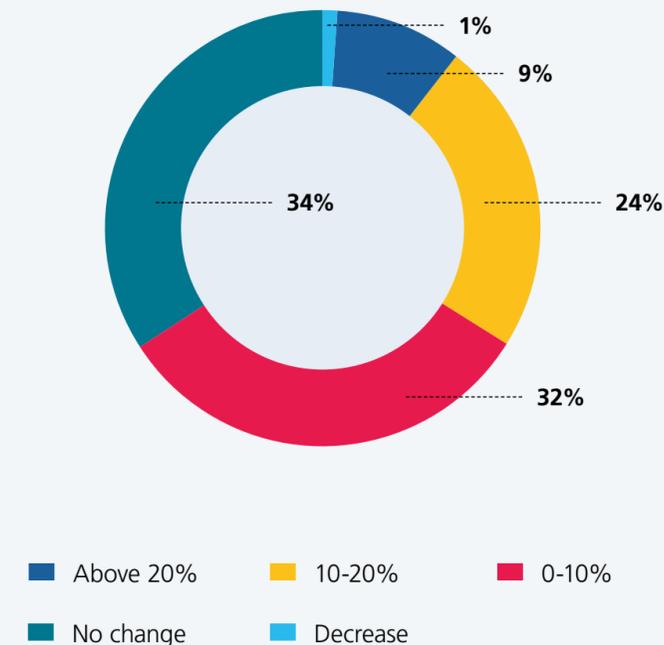
## "We have Industry 4.0: smart offices, smart factories and production lines"

**Dóra Petrányi**
Partner, CEE Managing Director, CMS

# Is CEE 5G ready?

Of all digital technologies, 5G continues to make the biggest headlines. Viewed by some as a transformative technology, not least for CEE companies, full European 5G standardisation is not yet complete. Although more network sharing is already happening, there is clearly some uncertainty from regulators at a national level. For businesses throughout the region, certainty is a paramount concern.

Survey respondents are divided on how much their digital agenda is reliant on 5G roll-out: only 10% said a lot; 36% somewhat and 54% not at all. Magyar Telekom successfully bid for a 5G commercial licence in Hungary earlier this year. But much remains to be done before it is fully operational. *'Applications using 5G - that's not the present, but the future,'* says Gergely Barczy, general counsel at T-Systems Hungary, an affiliate of Magyar Telekom.

Many would argue that the most important component of CEE's digital future comes with systems and processes that use artificial intelligence (AI) as part of their operation. Notably, among survey respondents, 58% already use AI solutions. But there is widespread concern about risk: 45% are concerned and 15% very concerned about security risk, while 86% are worried (including 10% who are very worried) about potential legal liability issues.

Nevertheless, opportunity and risk are equally balanced: 83% (19% to a significant degree) are planning future AI investment. Guidance and regulation are seen as key with 60% of respondents expressing a desire for more of both. *'It's a permanent debate between the business divisions and data scientists on one side and compliance and data protection on the other,'* says Ara Abrahamyan, Chief Digital Transformation Officer at the Erste Group.

*How much does your digital agenda rely on 5G roll-out in your CEE jurisdictions?*
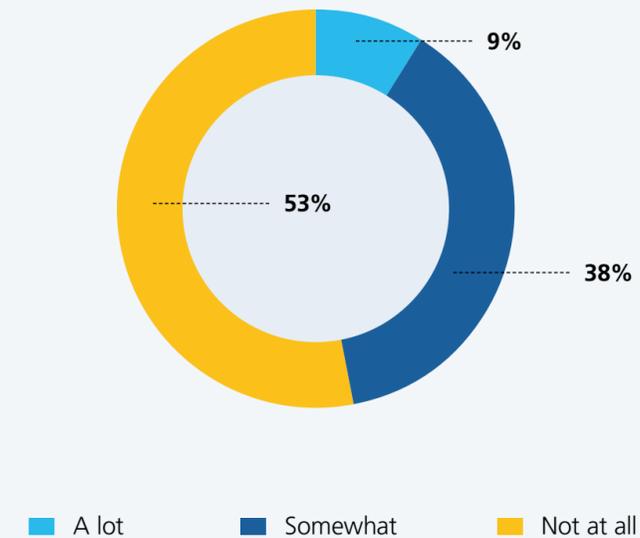
9%

53%

38%

- A lot
- Somewhat
- Not at all

*"A permanent debate between the business divisions and data scientists on one side and compliance and data protection on the other."*

**Ara Abrahamyan**
Chief Digital Transformation
Officer, Erste Group
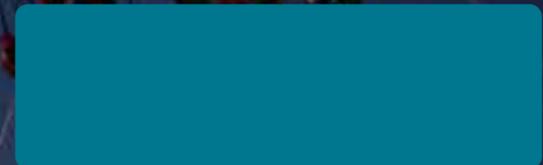
# AI regulation - (un)necessary disruption?

Responsibility for future regulation of AI resides both with national governments in CEE and, more immediately, at an EU-wide level. As with developing the necessary infrastructure to ensure that digital transformation is possible, there is frustration concerning the pace at which change is being implemented.

Conversely, some fear that introducing new AI-related regulation that is too onerous or restrictive may hamper growth. *'Everyone understands that AI machine learning is less to do with algorithms, and more to do with the variety and quantity of data you collect,'* says Joshi. *'It's easy to puncture this balloon before it's fully expanded. If you regulate and prevent companies from collecting data, you might see AI not taking off in your country or your region – that's a real fear.'*

Whatever regulations may eventually be put in place, the ultimate responsibility for regulatory compliance and the ethical use of data under their control resides with companies themselves. Here, as with GDPR, there may be a difference in standards between what the law requires and what is deemed ethical. In this context, the role of governments is to regulate as soon as is practicable, achieving the right balance to ensure that any difference is not too great.

By fundamentally disrupting the business landscape, the pandemic has significantly accelerated the shift to digital. The digitalisation outlook in CEE is therefore very positive, although a lot remains to be done: most organisations that have engaged in digitisation are still in the relative early stages of their digital transformation. To achieve that transformation, having the right local advice at hand is critical.

## Is public bureaucracy an impediment to your company's digital agenda?

*To what extent do you feel that public authorities in the CEE jurisdictions in which you operate support your company's digital agenda?*

- 3%
- 11%
- 11%
- 13%
- 56%
- 6%
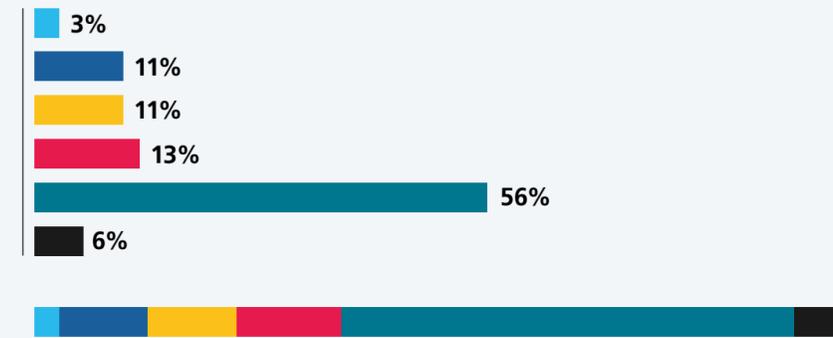
- Public authorities have kept pace with/ facilitated digitalisation in the private sector
- Public authorities have made some advances, but the level of bureaucracy is low
- Public authorities have not made many advances in this area, and the level of bureaucracy is high
- Public authorities have not made many advances in this area, but the level of bureaucracy is low
- Public authorities have made some advances, but the level of bureaucracy is high
- Other

# Digital Horizons

A series of reports exploring CEE's digital future

**Closing the gap – CEE's digital infrastructure and business ambition**

2020

# Data highlights

**65%**

of companies see digitalisation as a priority

Digitalisation has become one of the most important priorities for CEE businesses

**38%**

believe that digital infrastructure is more advanced globally than in CEE

A growing number of companies see the need for better infrastructure in the region

**88%**

are confident that EU/regional and local digital infrastructure strategies will meet their business ambitions in 3-5 years

There is widespread optimism that the right medium-term infrastructure strategies are in place

**65%**

plan to increase their IT budget next year to invest in digitalisation

Most companies anticipate the need to commit greater resources to digital

**6%**

postponed digital projects because of the Covid-19 pandemic

Despite its huge impact, the pandemic has delayed very few digital projects

**45%**

have accelerated digital projects in response to the Covid-19 pandemic

The pandemic has fuelled the drive to go digital

# CEE – infrastructure to support ambition?

Digital infrastructure provides the bedrock for technology to operate at its optimum. The CEE region, which has achieved near convergence with the rest of the EU in manufacturing, is aiming for the same parity to be realised through the development of infrastructure which supports new digital technologies. The impetus to catch up rests with governments across the region by facilitating a digital transformation of the public and private sectors.

Although a gap persists, it is beginning to close, as Markus Fleischer, who is responsible for Corporate Development at A1 Digital, explains: *'CEE is catching up in the digital transformation journey. The leading players in each country are starting to get more engaged in topics like the cloud and IoT (The Internet of Things), but the scale and size of projects in CEE is still smaller than in markets like Germany. It's important to note that in CEE a competitive pricing strategy and local market know-how, often in liaison with partners, is crucial to win.'*

In the drive to bolster CEE's digital competitiveness, levels of internet access, high speed broadband, e-commerce and 4G usage are already high. According to the EU's Digital and Economy Index, Poland, Hungary and Romania score above the EU average in connectivity, while the FT reported that Bulgaria's IT sector attracted record tech investment last year of USD 3.2bn, according to the International Data Corporation (IDC). This year, Bulgaria also announced a RegTech Sandbox.

Future digitalisation will offer a route to further and faster convergence: better connectivity through the continued rollout of 5G networks, more widespread use of AI technologies across multiple sectors, and much greater use of digital services by the private and public sectors alike.

Moving forward, CEE businesses seem set to increase their adoption of digital tools and take advantage of digital solutions to expand beyond their, often small, domestic markets. Collaboration between CEE countries, such as the V4 group (Czech Republic, Hungary, Poland and Slovakia) may also assist. Underpinning this, many CEE countries benefit from an educated, skilled workforce with high levels of technology expertise and a glut of STEM graduates.

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**88% are confident that EU/regional and local digital infrastructure strategies will meet their business ambitions in 3-5 years**

*How confident are you that EU/regional and local digital infrastructure strategies will meet your business ambitions in 3-5 years' time?*

- 22%
- 66%
- 9%
- 3%

■ Very Confident   ■ Somewhat confident   ■ Not confident at all   ■ Other

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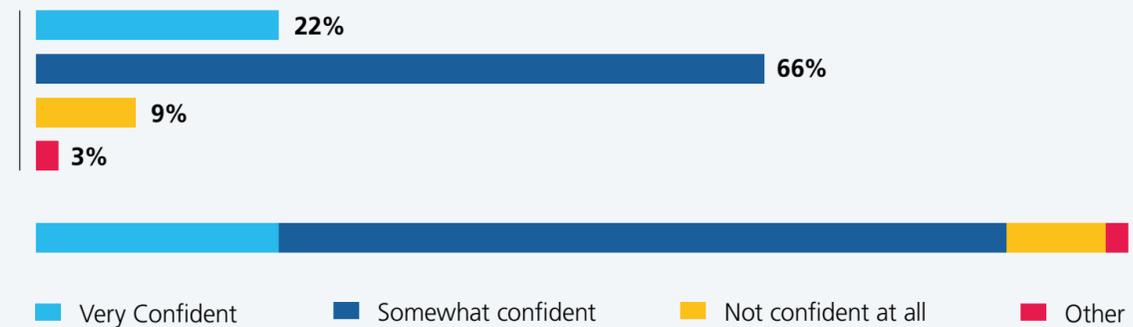
*"CEE is catching up in the digital transformation journey"*

**Markus Fleischer,**
Corporate Development, A1 Digital

# 5G launching across CEE

> ## "It's crucial that as much new CEE investment as possible goes into forward-looking and future-proof communications technologies rather than patching and upgrading older technologies with a limited lifespan."

**Chris Watson**
Partner, Global Head of TMC, CMS

> ## "There will be a lot of work with 5G – a big network building project is needed"

**Gergely Barczy**
General Counsel, T-Systems Hungary,
an affiliate of Magyar Telekom

Among those sectors where digitalisation matters most are telecoms, financial services and manufacturing. Gergely Barczy, general counsel at T-Systems Hungary, an affiliate of Magyar Telekom, says: *'The Hungarian mobile networks are some of the best in the world, but if you look at how administrative procedures are digitalised in Hungary some other CEE countries are better. We have been talking about digitalisation for years and some steps are now being taken.'*

Following an auction by the Hungarian regulator in April, Magyar Telekom, a unit of Deutsche Telekom, jointly launched commercial 5G in Hungary, together with Ericsson. The Hungarian units of Vodafone and Telenor ASA's were also awarded 5G frequencies in the tender. For his legal department, Barczy says, 'there will be a lot of work with 5G. A big network building project is needed to utilise the frequency, requiring a lot of cell towers.'

The same applies in Poland, which launched its first commercial 5G service in June, reaching nearly 900,000 people in seven cities, including Warsaw, Lodz, Poznan, and Wroclaw. Meanwhile, Bucharest recently became the first city in Romania to offer 5G connectivity to every inhabitant through the Orange mobile network.

At Europe's largest industrial manufacturing company, Richard Bacek, Siemens General Counsel, Czech Republic, Romania and Slovakia, outlines their recent digital changes in CEE:

*'We want to work more digitally. Pre-Covid, people were hesitant to accept electronic or digital forms when signing, negotiating and communicating about contracts and documents. Now, they are much more willing to do so. We are seeing an increased demand from customers as well as from suppliers who use electronic versions of documents and e-signatures.'*

He believes that this will result in *'their sustained long-term use, even between external parties.'* Bacek is also seeing digital progress among public authorities, including regulators. *'Electronic or digital communications are accepted more than before,'* he says. *'It's still slow, that's what you expect from governments. But even in the Czech Republic, you have to communicate electronically in certain cases with public authorities. There's no other option.'*

Chris Watson, Partner and Global Head of TMC at CMS, adds: *"It's crucial that as much new CEE investment as possible goes into forward-looking and future-proof communications technologies rather than patching and upgrading older technologies with a limited lifespan. That will ensure that lack of capacity doesn't hold back rollout of currently available and near-term future services, but also that even newer and higher bandwidth services are able to be dreamed-of, created and brought to market without comms capacity being a limiting factor."*

## Explore more on 5G:

# Banks pioneers of the digitalisation agenda

This increased use of technology solutions in the public sector acts as a key driver to the overall digitalisation agenda. Across CEE, financial services are leading the way in the private sector.

*'With the development of mobile technology, we made a strong bet, investing a significant amount as part of a vision for a digital future, to develop a platform named George,'* says Ara Abrahamyan, Chief Digital Transformation Officer at the Erste Group. *'It's the first group wide product that offers our digital face to customers, our first cornerstone of digitalisation. It's been rolled out over years: Austria, Czech Republic, Slovakia, Romania, and we're now in the final stages in Croatia and Hungary.'*

András Fischer leads OTP LAB, the innovation hub of OTP Banking Group. He explains that OTP 'started to delve' into digital transformation in 2015, followed by a large-scale programme. The goal was to enable products and services over digital channels, while digitising internal processes as well. *'This brought faster digital solutions to the market, which our customers needed,'* he says. *'There weren't any major products or processes that required digitalisation because of COVID - that had already been done.'*

OTP's digitalisation projects included: new mobile and internet banking applications, end-to-end online loans and products, digital account opening, chatbots, cash-in cash-out intelligent ATMs, and a digital signing pad in every branch. *'Most common documents or tasks have now been digitised,'* adds Fischer. *'The programme was in Hungary, and there are similar programmes ongoing or completed in other OTP countries too.'*

*"There weren't any major products or processes that required digitalisation because of COVID - that had already been done."*

**András Fischer**
Head of Innovation,
OTP Bank

*"Banks in CEE will have to keep up a rapid pace of digital delivery and digital innovation to capitalise on the momentum of growing demand accelerated by the current pandemic."*

**Eva Talmacsi**
Partner, Co-Head of TMT in CEE, CMS

*How much do you think the pandemic will accelerate digital change in your business?*



- 1%
- 2%
- 4%
- 47%
- 46%
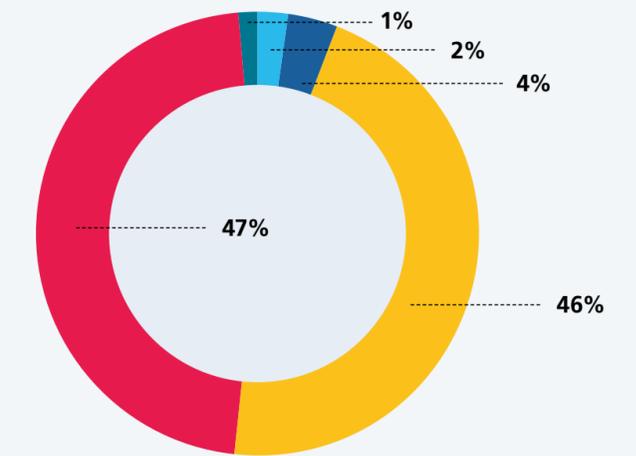
- Very much
- Somewhat
- Very little
- None
- Other

# Lessons learned

In the process, many lessons were learned. *'Everyone was really optimistic, but after 12 months, several projects reached the implementation phase around the same time. We realised there was no way that we could execute 30+ projects in parallel with the personnel we then had. That was a big challenge to solve. Since then, we have embraced an agile transformation, which enables higher efficiency and faster time to market.'* adds Fischer.

UniCredit also completed its CEE strategic digital plan in 2019. *'The overall aim was to invest heavily in technology and digital in order to have a material shift of the business towards remote channels,'* says Marco Iannaccone, the bank's Vice-Chairman in the Czech Republic and Slovakia. *'The logic was to create remote channels, especially mobile, and attract as many people as possible to use them.'*

Over the next two years, UniCredit will be growing omni-channels in CEE. *'It will be one process across channels, creating a digital end-to-end process with no manual intervention in-between,'* says Iannaccone. *'In the branch, at home, you will see the same screen, the same approach. It will be a bit of a revolution in retail banking.'*

The problem, he explains, is that *'you can't digitalize everything: you need to be selective and try to be very successful in fewer things. If you try to digitalize too much, it will cost too much and most probably, become unmanageable. Sometimes, you simply can't digitalize something because it's too complicated and you need to find a solution how to handle. You only discover when you try.'*

The experiences of CEE banks show how challenging digital transformation can be, particularly when it is being executed for the first time. But the rewards can be significant too. As diverse CEE businesses follow in their digital footsteps, they too will face their own set of challenges. When the region's digital infrastructure is finally completed, it will help to cement CEE's position as an increasingly attractive place to invest.

*How important is digitalisation for realising your immediate business goals?*

35%

65%

■ Yes, it's a priority  ■ Somewhat important

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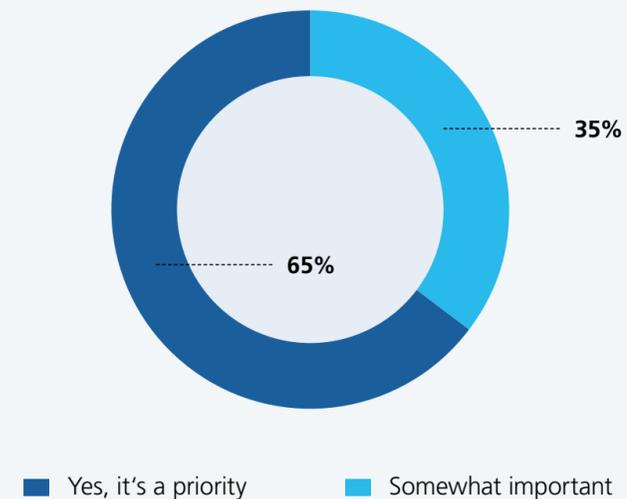
# Digital Horizons

A series of reports exploring CEE's digital future

**Data and ethics – what does the future hold for CEE?**

**2020**

# Data highlights

## 40ZB

**2020 global data volume 40ZB, up from 8ZB in 2015 + 1ZB in 2010**

As the volumes of big data grow exponentially, it presents huge challenges

*source: IDC*

## 99%

**believe that data matters to their business**

There can be no doubt that data provides great value for virtually every business

## 98%

**consider ethics as part of their current guidelines and policies**

Safeguarding data, considering the human cost and making decisions based on brand values are key

## 62%

**already invest in data analytics**

The added value of data analytics is self-evident to most businesses
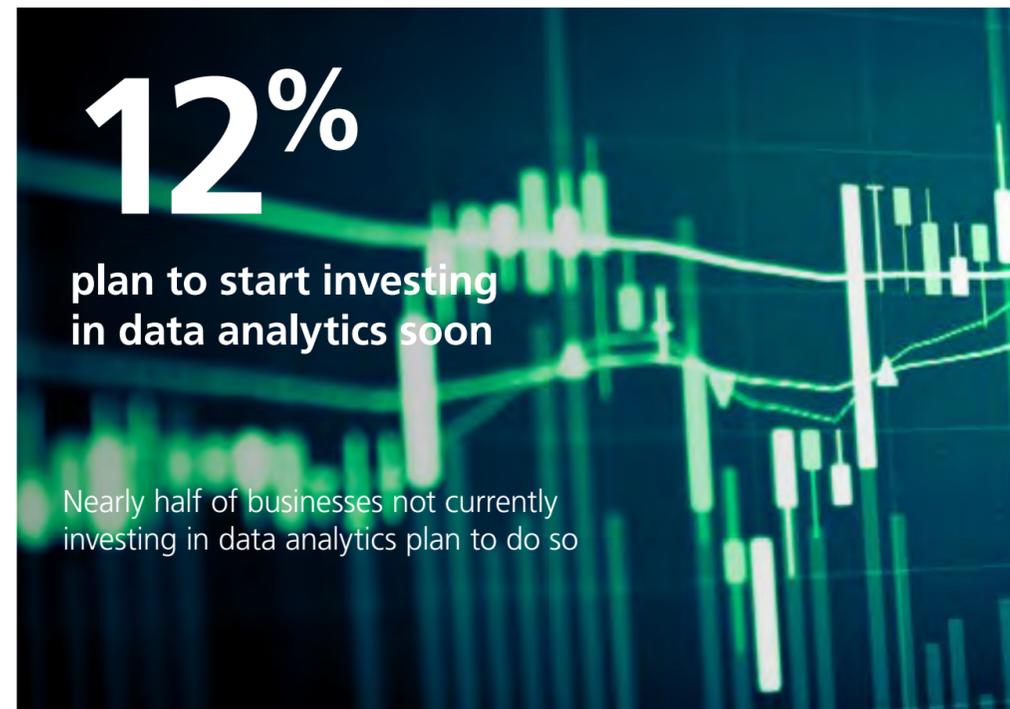
## 12%

**plan to start investing in data analytics soon**

Nearly half of businesses not currently investing in data analytics plan to do so
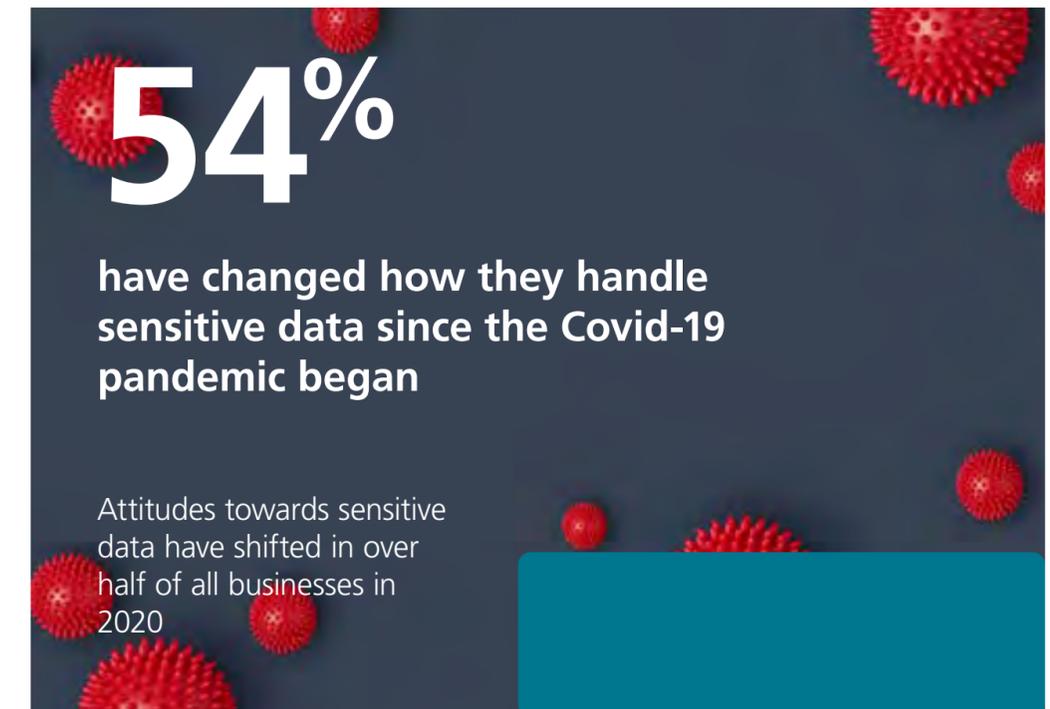
## 54%

**have changed how they handle sensitive data since the Covid-19 pandemic began**

Attitudes towards sensitive data have shifted in over half of all businesses in 2020

# Data, ethics and the grey lines
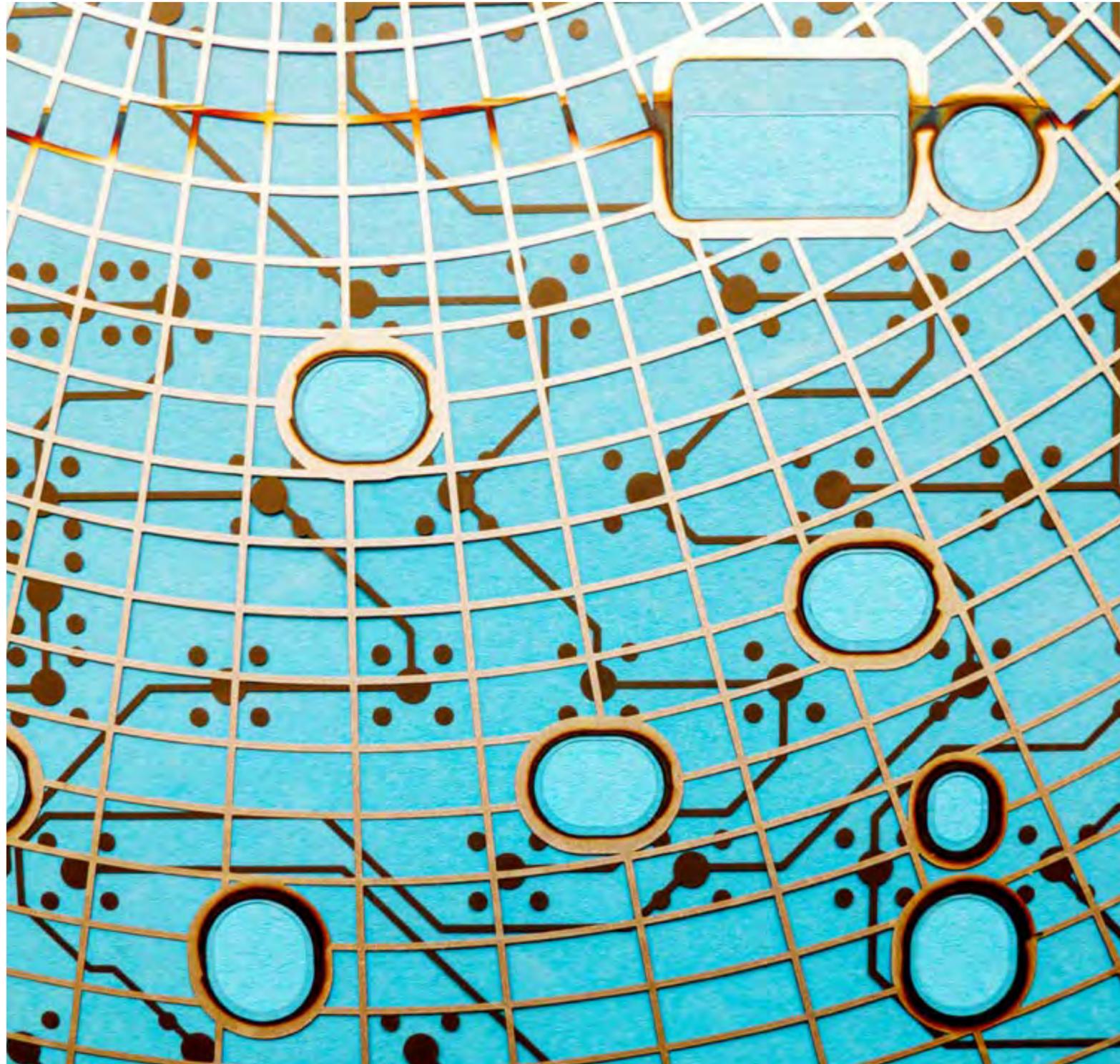


It has become a well-worn cliché: data is the oil of the 21st Century, an immensely valuable asset that is gradually being untapped. But unlike oil, data is not finite. Instead, it continues to grow at an exponential rate, both in volume and value.

The current volume of global data is estimated to be c.40ZB (ZettaByte=$10^{21}$), which has increased from 8ZB in 2015 and 1ZB in 2010. IDC predicts that the global datasphere will reach 175ZB by 2025. Such incomprehensibly large numbers give an indication of the scale of the challenge for those who have to manage ever larger volumes of big data.

CEE businesses that operate in the new digital economy are responsible for how they choose to use the data at their disposal. In determining what choices are made about how it is collected, shared and used, regulation can only go so far. The corporate ethics of each business must decide the rest.

Amit Joshi, Professor of AI, Analytics and Marketing Strategy at IMD, summarises the distinction:

*'If you just follow guidelines and regulations, you're probably already treading on some grey ethical lines. In most businesses, especially in relation to AI analytics, legal and regulatory guidelines will always be lagging technology, because they simply cannot move at the same speed. So, if businesses are just following the baseline, it's the bare minimum that needs to be done. But nearly every organisation would want to have ethical guidelines that are above what the regulatory framework says.'*

If each company sets its own ethical standards and then recalibrates them as necessary above existing regulatory compliance, it is written into the DNA of some CEE businesses at an everyday level.



- 1%
- 15%
- 84%
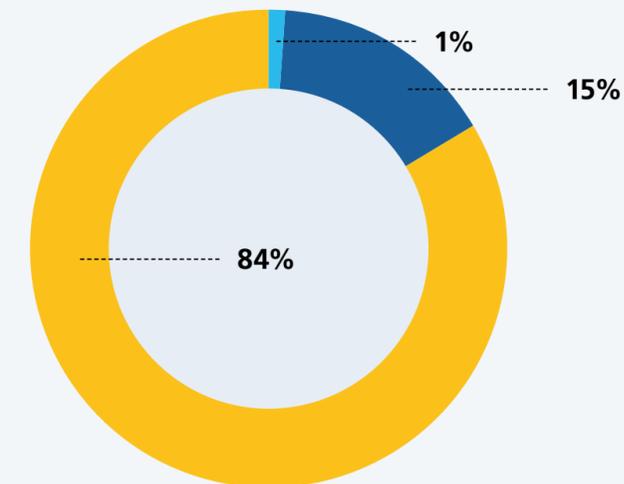
*Beyond data legislation/regulation, does you company consider ethics as part of current company guidelines/policies: safeguarding sensitive and personal data, considering the human impact or making decisions based on brand values?*

- ■ A lot
- ■ Somewhat
- ■ Not at all

# Ethics beyond law

*'Our corporate culture is defined by Ethics & Respect and our guiding principle is Do the Right Thing, which helps us live by these values,'* says Marco Iannaccone, Vice-Chairman at UniCredit Bank, Czech Republic and Slovakia. *'Whenever we do something, we always refer to that motto. You can have all the systems on the planet to prevent you from making mistakes, but the compensating factor between the system and doing the right thing is having the right management.'*

Complying with the law and being ethical can therefore require two different levels of corporate behaviour which are not always fully aligned. Business conduct that is entirely within the law may be regarded by some as unethical. *'It's really hard to draw a line: up to what point can a company go, ensuring maximum privacy versus collecting data to improve services,'* says András Fischer, Head of Innovation at OTP Bank.

What banks do is very limited compared to what the big tech companies are doing, he suggests. *'Banks strictly follow the rules. At OTP, we only use data that customers have approved for personalised product offerings. Tech companies went too far, but perhaps banks haven't gone far enough in terms of data usage.'*

There is no doubt that data really matters to a diverse range of CEE-based companies. According to CMS research of nearly 100 businesses in the region, 99% of respondents state that it is important with 80% believing that it is extremely important. The corollary is that three quarters of them currently invest in data analytics (62%), or soon plan to (12%). Equally, when asked whether their company considers ethics as being integral to how they do business, only 1% answered no.

## How much data matters

*How important is data to your current way of working?*

1%
19%
80%

■ Neutral    ■ Somewhat important    ■ Extremely important
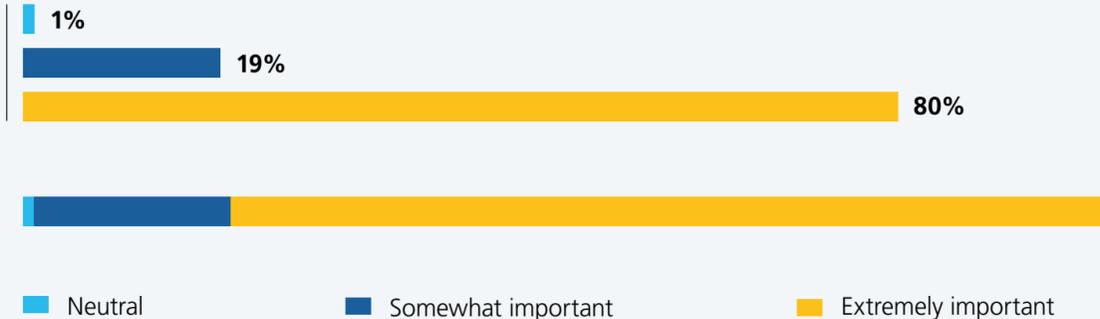
# GDPR changes culture



## "Europeans have decided that GDPR has been rather good and that they've created an incredibly high standard"

**Clive Gringras**
Partner, Head of Technology, Media and Telecommunications, CMS

## "Everything we do with our data is under the highest level of scrutiny"

**Stefan Haebich**
Managing Director, George-LABS, part of the Erste Group

This remarkable ethical uniformity is partly a consequence of the GDPR, which became applicable in May 2018, after the EU agreed to a major reform of its data protection framework.

Simultaneously adopted into local legislation by each member state, it has helped to transform the cultural as well as the legal landscape in terms of how companies, store, manage and use customer data. *'Europeans have decided that GDPR has been rather good and that they've created an incredibly high standard,'* says Clive Gringras, Head of Technology, Media and Telecommunications at CMS.

Among interviewees in local and multinational businesses across the CEE region, compliance and monitoring levels are certainly high. *'We have a very strong network covering the GDPR with experts in every country: it's a very robust, very solid mechanism, and very well implemented,'* says Kamil Šebesta, Legal Director, Medical Devices Group at Johnson & Johnson.

Stefan Haebich, managing director of George-LABS, part of the Erste Group, adds: *'We make sure that everything we do with our data is under the highest level of scrutiny of need to know, need to see, and GDPR compliant. In the context of AI machine learning and big data, we can generate so-called "synthetic data" that is fully GDPR compliant, but still reflects the behaviour patterns of our customers.'*

As a key technological tool in the use of data, AI-based systems and processes are increasingly the norm. Flagged as the next regulatory step to prevent potential misuse or abuse, the European Commission (EC) has proposed a White Paper, which includes policy and regulatory options that seek to address areas of high-risk involving AI usage.

EU policymakers regard it as creating an opportunity for member states to compete internationally, predicated on the belief that implementing higher ethical standards in the future use and application of data will benefit businesses and their customers.

*'I don't think the existing laws do a sufficient job: the nature of AI is changing too rapidly,'* notes Joshi. *'But if we do come up with a regulatory framework for AI, like GDPR which already impacts AI and the collection of data, we might go in the other direction by hampering growth.'*

# AI law - a step too far?

Many share his concern that future AI regulation might become a potential impediment to companies doing business in Europe, given that China currently has no such regulations, while comparable US regulation is confined to The California Consumer Privacy Act (CCPA), which became law in January 2020. However, the CCPA's core legal framework differs in several respects from the GDPR. For example, whereas the latter requires a "legal basis" for the processing of personal data, the CCPA does not.

*'Businesses operating in CEE, and across the EU, are only using data in an ethical way, but that means in reality that we don't use data,'* suggests Gergely Szertics, business partner at AI Partners. *'So, technically it's not a regulated and conservative data market, it's become a frozen data market that we don't use compared to a very liberal data market in the US.'*

His fear is that further EU regulation may add to the data gridlock. *'I hope that this is not going to cause a meltdown when using AI,'* he says. *'The big lesson is that the GDPR just created lockdown in many companies' minds: just having data, using data or even trying to monetise data, that became a curse, you can't monetise data, that's just unethical.'*

As the volume of data held by companies continues to grow, so inevitably will the commercial imperative to monetise it. Whatever future regulation might aim to achieve in further protecting consumers and customers, a balance needs to be struck in order to avoid shackling businesses, thereby rendering them powerless to act.

Determining the future ethics of what each CEE business does with their data and how they do it is distinctly personal. It will require carefully calibrated responses to a constantly evolving technological landscape. Looking ahead, the business of ethics may become as important as the ethics of business.
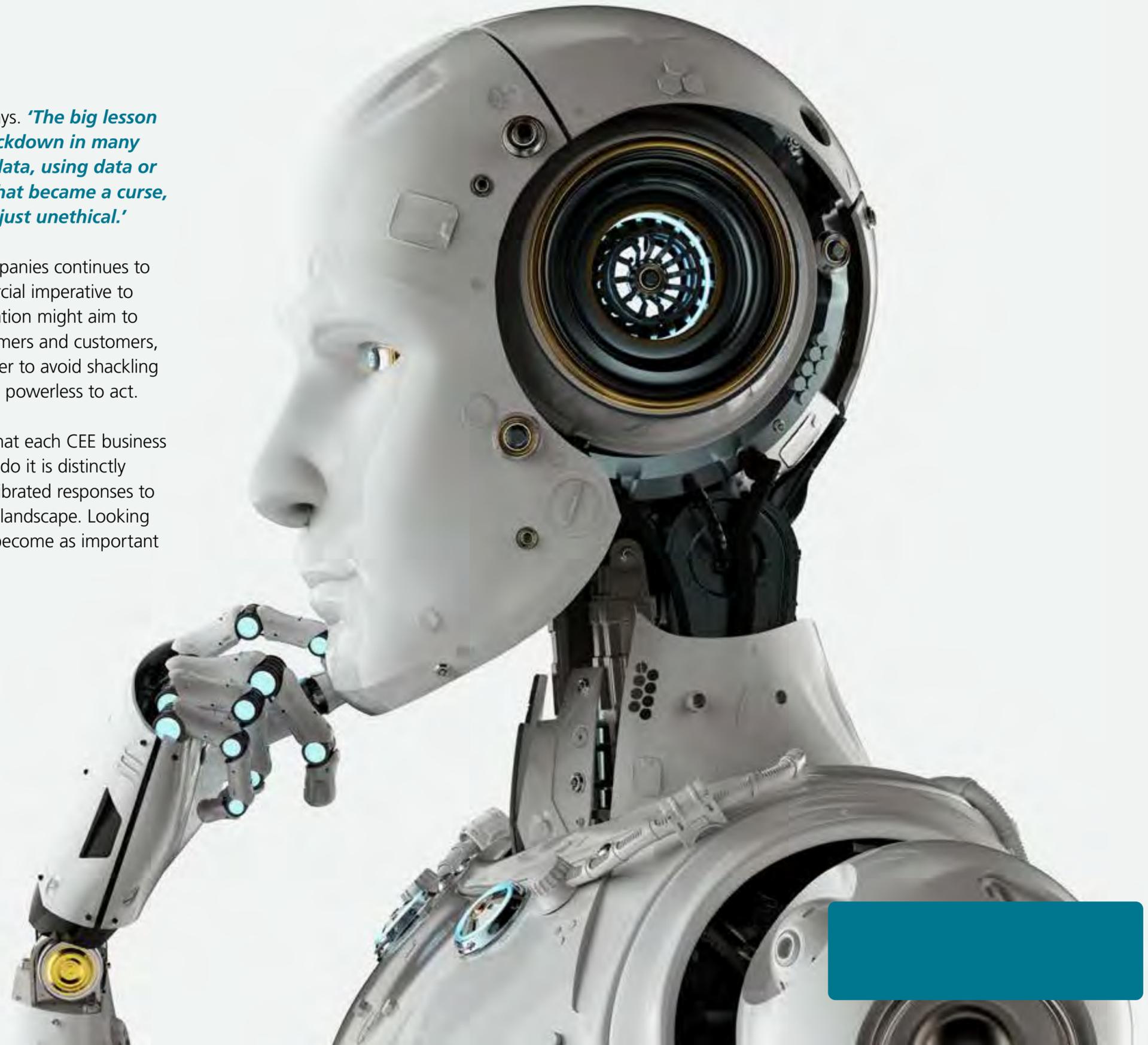
# Explore these topics more:



## CMS Breach Assistant

**The ultimate guide to dealing with a data breach**

Find out more [here](#)
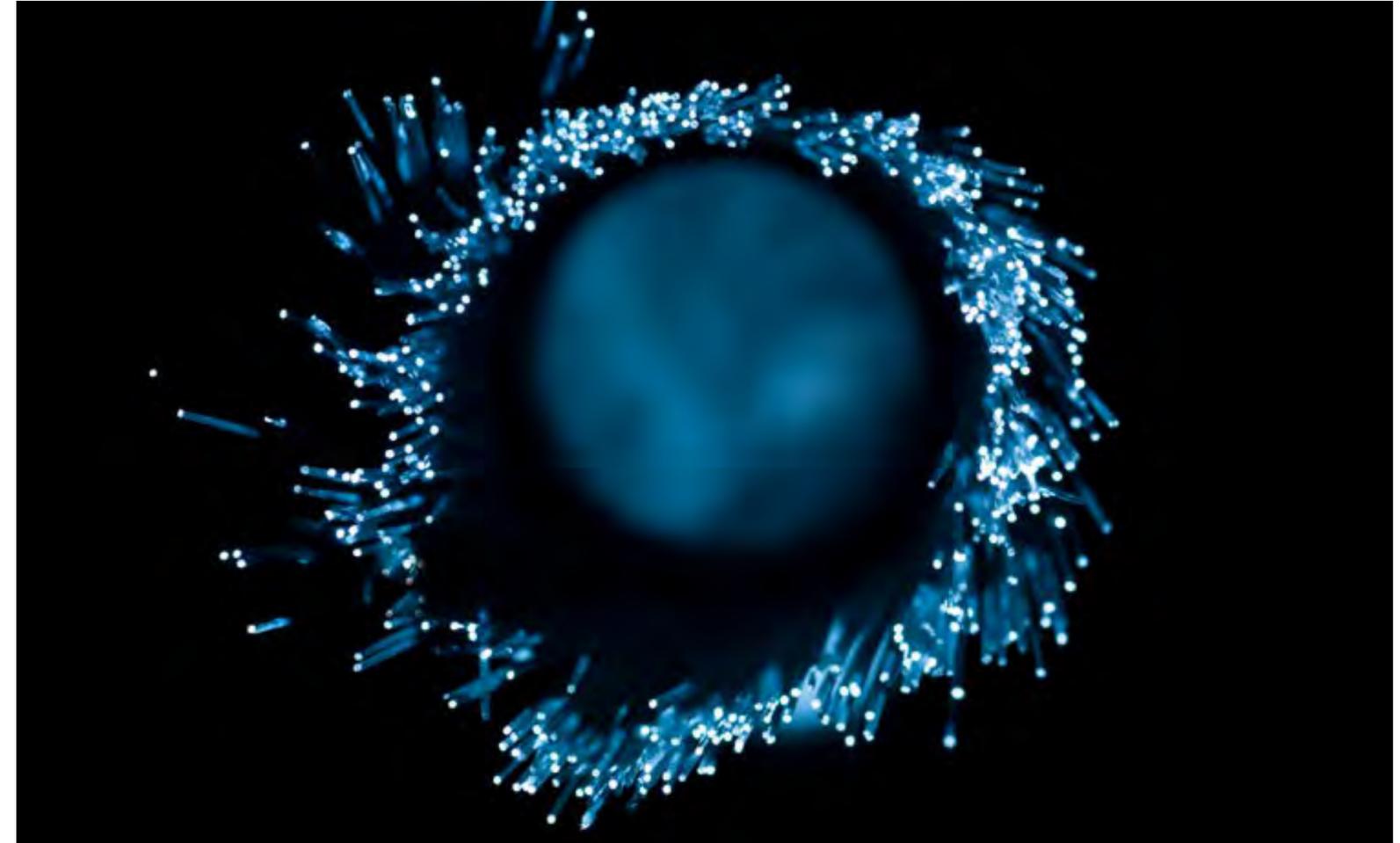


## GDPR enforcement tracker report

Find out more [here](#)

# Digital Horizons

A series of reports exploring CEE's digital future

**Innovation vs regulation –**

**can AI redefine CEE's economic future?**

2020

# Data highlights

## 58%
**already use AI solutions**

The benefits of cost and efficiency are driving businesses to use AI

## 83%
**plan to invest in AI in the future**

Looking ahead, a significant majority plan AI-related investment

## 60%
**are concerned about security**

Cybersecurity is a major issue when using AI solutions

## 86%
**are worried about AI legal liability issues**

Concern over legal liability in AI systems is the single biggest concern
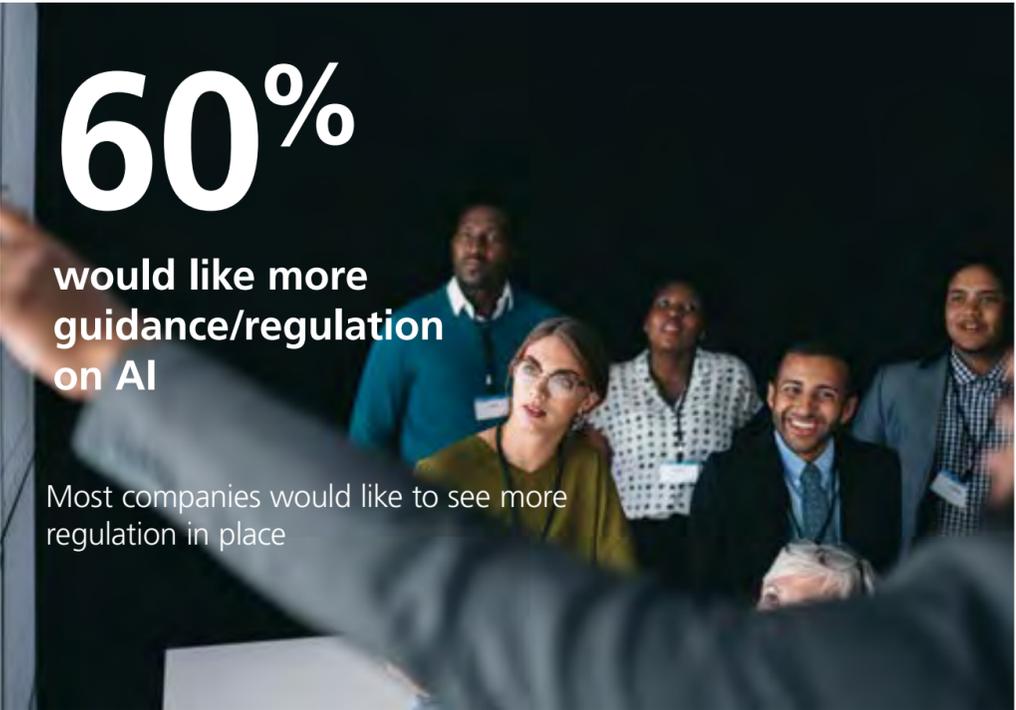
## 60%
**would like more guidance/regulation on AI**

Most companies would like to see more regulation in place
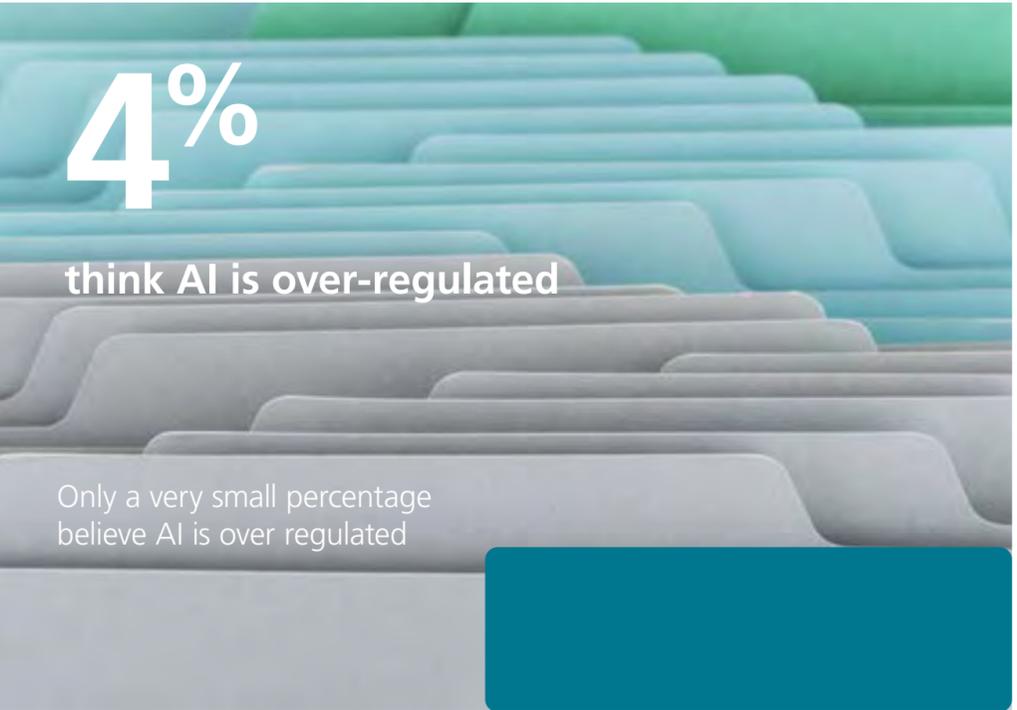
## 4%
**think AI is over-regulated**

Only a very small percentage believe AI is over regulated

# AI's evolution – what does it mean for CEE?

Among the technologies that are set to redefine the world, arguably the most significant is artificial intelligence (AI) - seen by many as the key instrument of change, not least because of what it can deliver in productivity, speed and efficiency. Across the CEE region, as elsewhere, AI is evolving quickly: its tangible benefits are being felt faster and more widely than was anticipated by some businesses.

*'AI is the future,'* says Kamil Šebesta, Legal Director, Medical Devices Group at Johnson & Johnson. *'It is helping to raise quality and standards in the simplification and unification of care, particularly AI solutions that are able to learn. There are some machines that when you give them a substantial amount of information, they are able to learn based on small differences. They can predict outcomes and the best approach.'*

Nevertheless, uncertainty remains elsewhere about what benefits can be derived and when they might reach fruition. *'It's still quite difficult to understand what AI can really do,'* says David Kozák, Honeywell's General Counsel EMEAI. *'Is it data management that can provide me with some results that allow me to make quicker or better decisions? Expectations are really high, but I'm not sure that the outcomes are always there.'*

One thing is certain: every sector, not just TMT and financial services, is already being affected to some degree by new AI systems, new AI architecture, and new AI solutions. Other sectors most likely to see the greatest impact in the 2020s include: healthcare, life sciences, manufacturing, logistics, retail, energy, automotive and transportation. This will not only affect large multinationals operating in CEE, but also smaller national companies that may be less likely to be using AI currently.

## Do you plan to invest in AI in the future?

- 16%
- 19%
- 65%
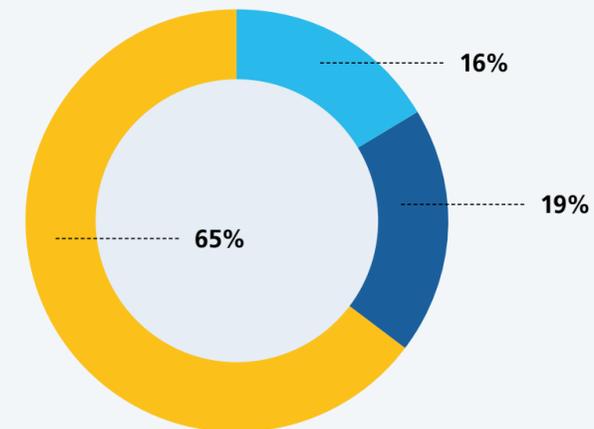
- Yes, heavily
- To some extent
- No

*"Expectations are really high"*

**David Kozák**
General Counsel EMEAI, Honeywell

# Co-operation needed – developing a CEE ecosystem
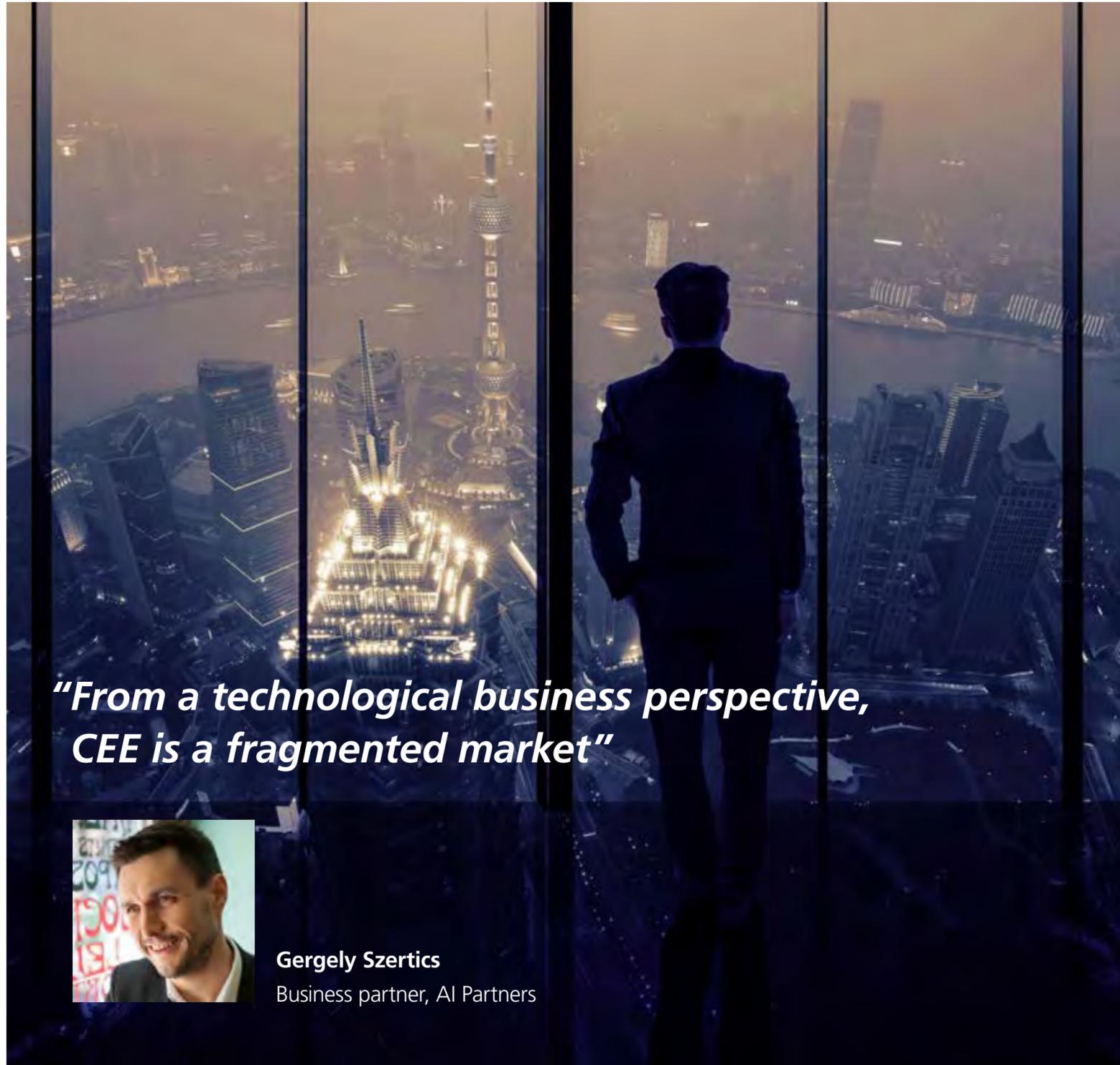
Although there is huge AI research and business potential in several CEE countries, especially when cooperating together, when acting alone, size and scale can be challenging. *'From a technological business perspective, the CEE region is a fragmented market,'* says Gergely Szertics, business partner at AI Partners. *'The platform technologies like IBM, Microsoft and Google, and start-ups that are living on the top of these technology companies, are the key AI business model, although a variety of companies are trying to develop their own services.'*

As a counter to that fragmentation, the V4 countries (the Czech Republic, Hungary, Poland and Slovakia), are seeking to advance co-operation in AI. Their most recent report, AI-Driven Transformation, concluded: *'Unlike Lisbon or Stockholm, none of the V4's major cities are listed in global rankings of start-up hubs. V4 needs a strong ecosystem based on AI, HPC and cybersecurity. The support for concentration of R&D should be coordinated to regional hubs and mutually supportive networks to maximize V4's competitiveness.'*

To keep pace with AI developments in the US and China, some multinational companies are locating their regional AI R&D functions in CEE. Taking advantage of high levels of local expertise, those which have already done so in Hungary include Nokia and Ericsson. CEE enjoys a large pool of talent in science, technology, engineering, and mathematics (STEM) and ICT, with nearly 250,000 graduates in these subjects—more than any of the EU Big Five markets.

In CEE overall, the current use of AI technology may be uneven across organisations, from country to country and from function to function, but use it they do. From CMS research of nearly 100 companies in the region, nearly 60% already deploy AI solutions. *'Right now, in CEE organisations there is AI, including pockets of excellence, but they are isolated because this process has not been evenly diffused throughout organisations,'* says Amit Joshi, Professor of AI, Analytics and Marketing Strategy at IMD.

*"From a technological business perspective, CEE is a fragmented market"*

**Gergely Szertics**
Business partner, AI Partners

# Identifying risk - where does liability lie?

Inevitably, banks are among those at the forefront of AI development. András Fischer, Head of Innovation at OTP Bank, explains: *'We apply machine learning and some AI components to provide personalised offers in our CRM system, via email, and within our online services. We also use this data to feed our chatbots. So, to some extent we use AI, but not like Google or Amazon.'*

Ara Abrahamyan, Chief Digital Transformation Officer at the Erste Group, adds: *'One of the cornerstones of our digital transformation agenda is data analytics: Generating insights out of the data. We need to make best use of it to better service our clients.'*

Meanwhile the commercial impetus to develop the full potential of what AI can offer businesses in each sector is counterbalanced by the need to mitigate operational and legal risks, which are arguably magnified by the absence of AI-specific regulation.

In a recent CMS survey of the CEE region, security risk and potential legal liability issues in relation to AI are highlighted as significant concerns by the overwhelming majority (86%) of respondents. Olga Belyakova, CMS partner and co-Head of TMT in CEE, explains: *'Businesses that want to use AI all face the same legal challenges: who has responsibility for using AI systems and any liabilities which may arise?'*

Richard Bacek, General Counsel Siemens, Czech Republic, Romania and Slovakia, develops the point: *'We need to identify risks, especially in local legislation, regarding liabilities towards customers and the liabilities of our customers towards their customers and third parties, how those risks are treated, and how you can mitigate them at a local level. People who are selling Siemens products that contain AI need to know about the risks.'*

*"Who has responsibility for using AI systems and any liabilities which may arise?"*

**Olga Belyakova**
Partner, co-Head of TMT in CEE, CMS

# AI regulation - dampening innovation or sorely needed?

Szertics says: *'Everyone uses AI because it is so sexy and also very useful, but there are no real regulations around it.'* He argues that the EU aspires to be the torchbearer for trustworthy AI as part of its attempt to triangulate the competition between the US and China, which is often framed as a two-horse race. *'I talk to a lot of global companies, who say that the AI race is going to be a trust race and not just a technological race,'* he adds.

Aiming to promote the uptake of AI, while simultaneously addressing the risks associated with its use by examining a potential future regulatory framework, the European Commission (EC) has proposed a White Paper with policy and regulatory options "towards an ecosystem for excellence and trust".

The findings of the EC's consultation on the proposed White Paper were published in July. From the 1215 contributions received, only 3% think that current legislation is fully sufficient, 42% want the introduction of a new regulatory framework on AI, while 33% think that the current legislation needs to be modified. The main focus of new legislation would probably be on potentially high-risk AI applications – e.g. from the viewpoint of protection of safety, consumer rights and fundamental rights.

Reflecting a commonly held view, Bacek says: *'It would be good if there's one single legislative approach at a European level – that makes sense, subject to the condition that it's not too bureaucratic.'* His sentiment is echoed by Gergely Barczy, general counsel at T-Systems Hungary: *'In the future, it will be necessary to regulate AI.'*

Tomasz Koryzma, Partner at CMS and Head of IP in CEE, adds: *"AI is opening up transformational opportunities in all areas of human activity, but at the same time poses unique risks for companies, governments and society as a whole".*

If AI becomes subject to additional EU regulation, how can protecting European values be achieved without disadvantaging European entrepreneurs, and specifically, those based in CEE? The right balance may be struck by only regulating high-risk areas. For AI to achieve its optimum impact – locally and regionally – adherence to a common set of global principles might be the solution. But for now, that remains some way off.

**Explore more on AI:**

*How worried are you about potential **legal liability** issues when using AI technology/ies?*

- 9% Extremely worried
- 38% Worried
- 14% Not worried
- 39% Slightly worried
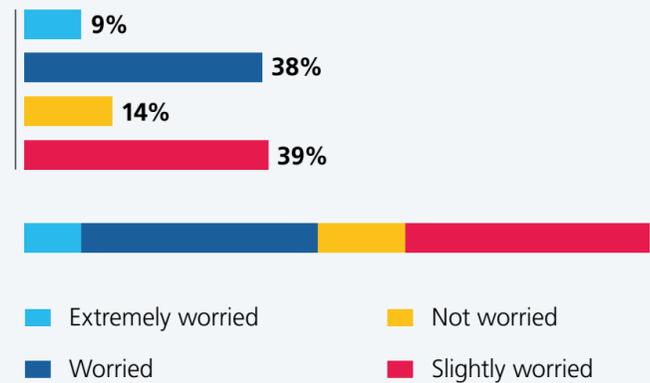
*Are you concerned about **security risks** when using AI and related new technologies?*
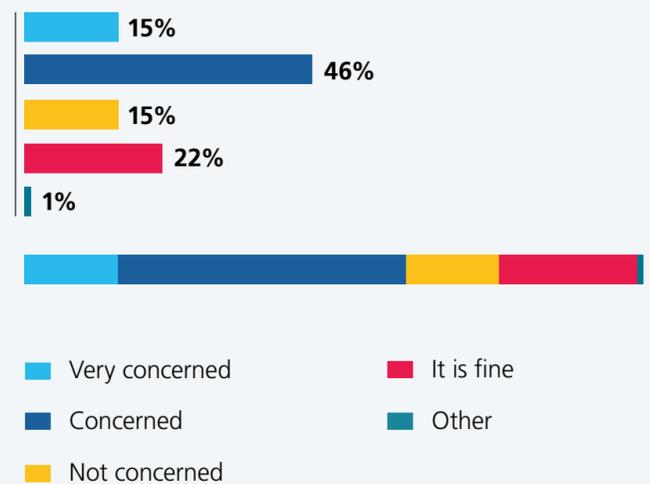
- 15% Very concerned
- 46% Concerned
- 15% Not concerned
- 22% It is fine
- 1% Other

*"AI is opening up transformational opportunities in all areas of human activity, but at the same time poses unique risks for companies, governments and society as a whole."*

**Tomasz Koryzma**
Partner, Head of IP in CEE, CMS

# Digital Horizons

A series of reports exploring CEE's digital future

**Technology transforming industries in CEE – what's next?**

2020

# Data highlights

**76%**

**would consider digital tech cooperation with other companies in their sector**

The problems of size and scale are driving tech co-operation in nearly half of all businesses

**58%**

**already use AI solutions**

Most companies in CEE have already committed to using AI solutions in their operations

**49%**

**of CEE businesses take sustainability into account in their digital strategy**

Smart tech holds out great potential for sustainability

**88%**

**are confident that EU/regional and local digital infrastructure strategies will meet their business ambitions in 3-5 years**

There is widespread optimism that the right medium-term infrastructure strategies are in place

**65%**

**of life sciences companies think digitalisation is important to achieve their business goals**

The life sciences sector perceives great value in the shift towards digitalisation

**84%**

**of life science companies plan further AI investment in future**

A large majority of life sciences businesses see AI critical to their strategic development

# Industry 4.0 - how smart is CEE?

Not to be confused with The Digital Revolution, which saw a shift from mechanical and analogue technology to digital, smart industries are the product of The Fourth Industrial Revolution. Better known as Industry 4.0, or I4.0, a term coined by the German government in 2011, it encapsulates the gradual automation of traditional manufacturing and industrial operations and methods using modern smart technology.

Technological innovations such as digital platforms, artificial intelligence (AI) and 3D-printing are among the disruptive forces behind smart technology. As machines become increasingly able to communicate with each other, a new lexicon has emerged: machine-to-machine communication (M2M), the internet of things (IoT) and Cyber-Physical Systems (CPS). In practice, these are driving the transformation of manufacturing and industrial operations across a broad range of sectors.

In context, total CEE spending on robotics and related services will reach more than USD 4.2bn in 2020, according to the International Data Corporation (IDC). *'The effects of Industry 4.0 can be seen right across CEE,'* says Dóra Petrányi, CEE Managing Director, Head of TMT, Hungary at CMS. *'We not only have smart offices, there is also an ever-growing number of smart factories with smart production lines. New digital infrastructure is the base of their operations.'*

Attracted by competitive labour costs, a skilled work force and benign local business conditions, manufacturing in CEE has benefited from robust FDI for many years: it now comprises roughly 20 percent of the combined CEE economy, compared to an EU- wide average of 15 percent. As the CEE manufacturing base becomes ever smarter, the systems deployed in factories, on production lines and across supply chains are becoming fully integrated and collaborative to meet changing demands and customer needs.

*How confident are you that EU/regional and local digital infrastructure strategies will meet your business ambitions in 3-5 years' time?*



- 22%
- 66%
- 9%
- 2%

■ Very Confident    ■ Somewhat confident    ■ Not confident at all    ■ Other
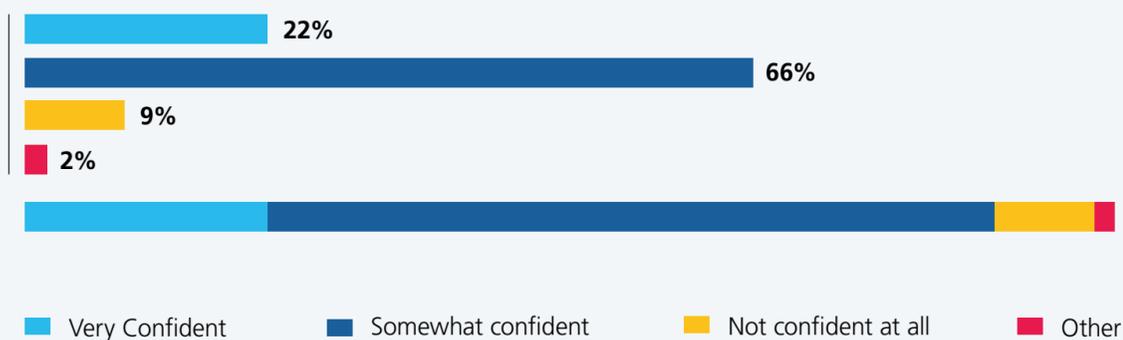
*"The effects of Industry 4.0 can be seen right across CEE"*

**Dóra Petrányi**
Partner, CEE Managing Director, CMS

# Digital factories

As the largest industrial manufacturing company in Europe, Siemens has a Digital Factory Division with smart plants across the CEE region. These aim to provide customers with *'a comprehensive portfolio of hardware and software products which enable the comprehensive integration of data from development, production and suppliers.'*

Richard Bacek, General Counsel Siemens, Czech Republic, Romania and Slovakia, says: *'We are facing increased demand from our customers on digitalisation of the production facilities using artificial intelligence in their production.'*

Smart tech is also being applied in retail. Ákos Fekti, Legal Director & Compliance Officer at Coca-Cola Hellenic Bottling Company, says: *'We operate in several CEE countries and have a digital strategy and initiatives for handling data. We have started to improve our digital capabilities, and are already seeing results like Innovative Lawyers 2020, published by the Financial Times, which recognises the simplification and standardization of contractual jobs in Coca-Cola HBC as a commended practice, and a business enabling innovation.'*

At present, Europe leads the way in the deployment of AI in manufacturing. Over half of the top European manufacturers implement at least one instance of AI in manufacturing operations, according to McKinsey.

Pushing further ahead in the use of I4.0 technologies is therefore integral to maintaining CEE's future international competitiveness. The V4 countries (the Czech Republic, Hungary, Poland and Slovakia), are seeking to advance co-operation in AI, arguing that *'the support for concentration of R&D should be coordinated to regional hubs and mutually supportive networks to maximize V4's competitiveness.'*

Gergely Szertics, business partner at AI Partners, concurs: *'It's an important part of the strategy of Hungary and other CEE countries: let's try to bring here more R&D centres that create greater synergies, particularly with the academic sector.'*

According to Amit Joshi, Professor of AI, Analytics and Marketing Strategy at IMD, the impact of smart technology will be dramatic. *'A small change in operational efficiency can translate to huge changes in the level of profit,'* he says.

Joshi anticipates *'massive applications for AI and tremendous value'* in streamlining operations in the energy sector as well as in construction – *'things like giving sensors to workers who are on the job.'* It can also be applied, he adds, to smart elevators, earthmovers, and cranes. *'Beyond the cool sexy applications of self-driving cars and drug innovation, or for product recommendations in retail and healthcare, these kinds of industries are going to be hugely impacted.'*

*"We are facing increased demand from our customers on digitalisation of the production facilities using AI in production "*

**Richard Bacek**
General Counsel, Siemens,
Czech Republic, Romania and Slovakia

# Smart cars

CEE is renowned for its high-quality, low-cost manufacturing operations, supply chain digitalisation and efficiency gains. Smart automotive manufacturing has made huge strides in the region, which has become the only place in Europe where the share of robots in the automotive sector (53%) surpasses the non-automotive sector.

In aggregate car production, The Czech Republic and Slovakia lead the way as one of the key European automotive hubs, followed by Poland, Hungary and Romania. Between them, these five countries produced nearly 5.2m cars last year – more than Germany. Smart technology is already being used in CEE factories by a range of manufacturers, including: Volkswagen, Škoda, Kia, Audi, Mercedes-Benz, Jaguar Land Rover, Hyundai, and PSA Peugeot Citroën.

Automotive and other manufacturing sectors also depend upon smart supply chains. In looking for ways to make them more efficient, manufacturers are turning to Industry 4.0 solutions, connecting diverse areas of their business. In practice, this involves using real time data, spotting weaknesses in equipment derived from multiple sensors and data points, and ensuring quick replacement of parts.

But cars are not the only sector to benefit from smart production. According to the IDC, COVID-19 is the new force shaping the evolution of IoT maturity in Europe, as companies are forced to adjust their technology road maps in response to the crisis.

*Do you anticipate greater cooperation with other companies in your sector in developing/ using digital technology?*

23%

44%

33%

- Yes
- Maybe
- No
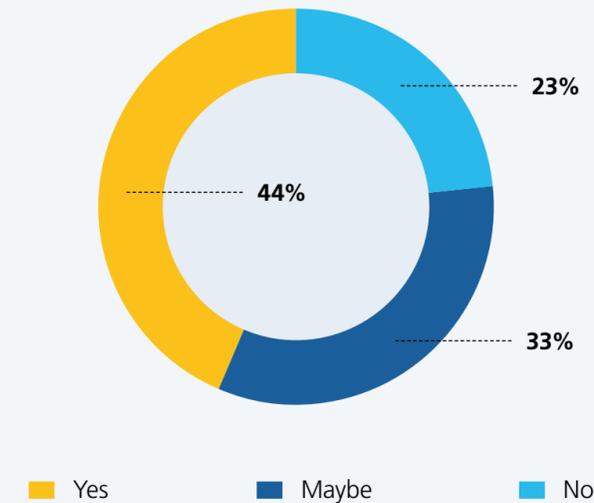
# Health-related innovation in CEE



*"Digitalisation has become a key part of the future "*

**Kamil Šebesta**
Legal Director, Medical Devices Group,
Johnson & Johnson

In fighting the pandemic, a range of advances in medical technology and biotech has put healthcare and life sciences centre stage. Health-related industries are among the most dynamic sectors for innovation in CEE: e-healthcare, telehealth, digital health, gene therapies, intelligent drug discovery and development, and consumer wearables are some of the drivers.

*'Johnson & Johnson is very interested in digital solutions and the digitalising of our work,'* says Kamil Šebesta, Legal Director, Medical Devices Group at Johnson & Johnson. *'Digitalisation, especially in the last six months, has become a key part of the future. We have digital programmes for our customers so we can help them make efficient use of their resources in hospitals. Our digital products can simplify some processes, making them more efficient and saving costs. These savings can help them to enhance and increase their capacity and quality of patient care.'*

CEE research among life sciences companies in the region shows that 65% of them believe that digitalisation is important in achieving their business goals, 62% are investing in data analytics, a third of them already use AI, while 84% plan further AI investment in future.

These levels of investment and application demonstrate the need for life sciences to become smarter still and reflect comparable levels of anticipated demand in other sectors. But size and scale, allied to cost pressures, are recognised as potential inhibiting factors in trying to achieve the required levels of sophistication.

The absence of an existing digital culture also holds some companies back from incorporating I4.0 technologies. Knowing that I4.0 is the right strategic choice does can automatically lead to instant adoption. It takes time and money. For that reason, 44% of respondents in all sectors, surveyed by CMS, anticipate greater cooperation with other companies in developing and using digital technology.

In mapping out their post pandemic strategy, there is still a way to go before every CEE business reaches digital maturity and becomes a fully smart operation. The post-pandemic shift in global supply chains will inevitably sharpen their focus with an increased interest in bringing production from Asia back into Europe.

To secure European supply chains of the future, CEE is very well-positioned. Taking advantage of these opportunities, international manufacturing companies are expected to set up new CEE operations to service the continent. Having the right technology and becoming smart will be a key part of that process.

# Explore these topics more:
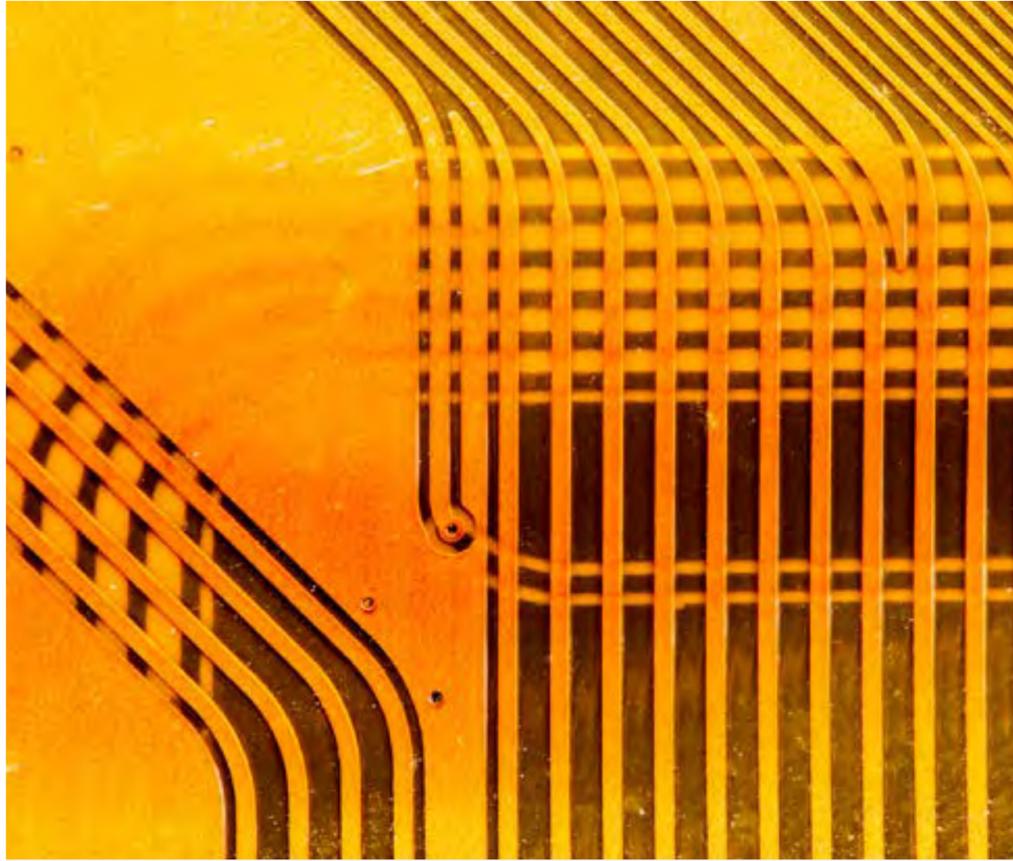


## Security Token Offerings

Find out more [here](here)



## CMS Expert Guide to Autonomous Vehicles

Find out more [here](here)
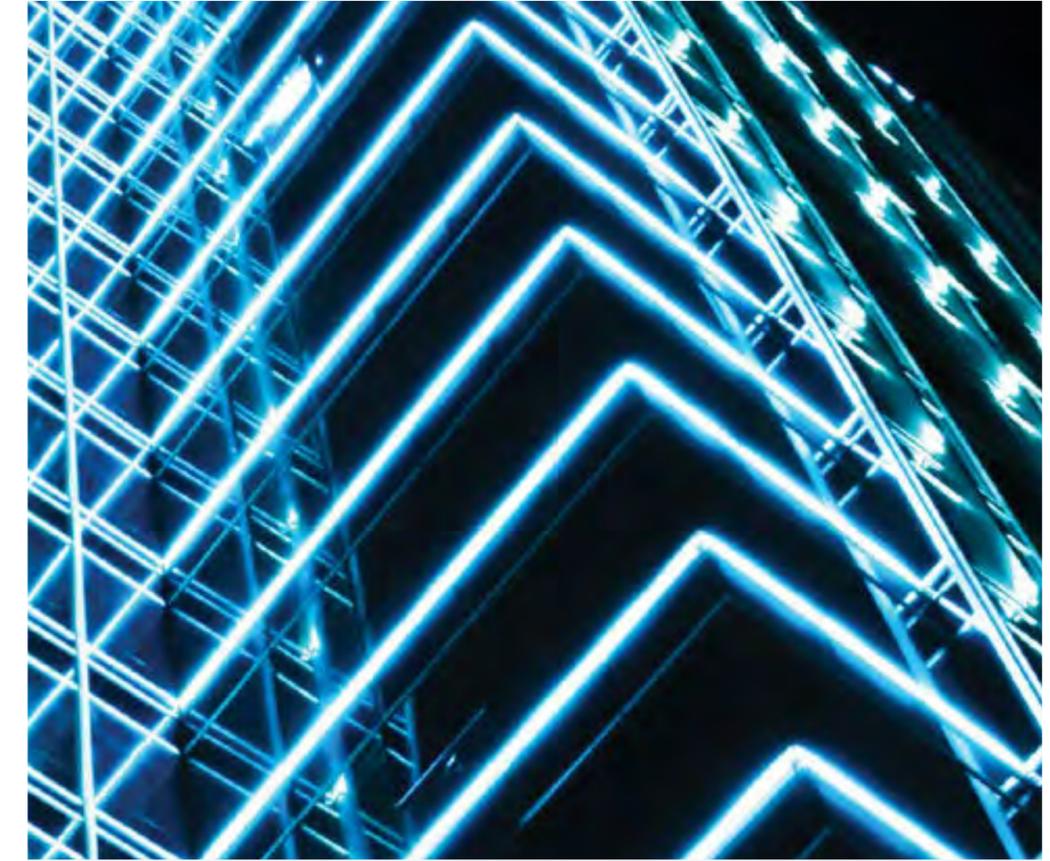


## Proptech – Smart Office

Find out more [here](here)

# Digital Horizons

A series of reports exploring CEE's digital future

**Stress-test: is your business' digital strategy future-ready?**

2022

# Stress-test: is your business' digital strategy future-ready?

**Does the growth in your IT investment create a fast-enough route to digitalisation?**

**Is your strategic planning sufficient to meet your digital transformation needs?**

**In developing your digital footprint, are you taking sufficient account of the risks?**

**As AI increases in your operations, have you put plans in place around mitigating potential legal liability?**

**Are you keeping up to date with new regulations that affect your digital activities?**

# Digital infrastructure in focus



Ensure that future projects comply with regulatory requirements: engage with regulators and seek legal assistance.

Collaborating with competitors? Regulatory compliance plus solid project documentation are a must.

Follow regulatory changes, practice network sharing, carry out self-assessment, and mitigate potential risks.

Adopt clear policies, teach regulatory/legal requirements, and implement reporting procedures.

Disaster recovery: make contingency plans for data breaches, cyberattacks & infrastructure malfunctions. Follow rules and protocols.

# Data in focus
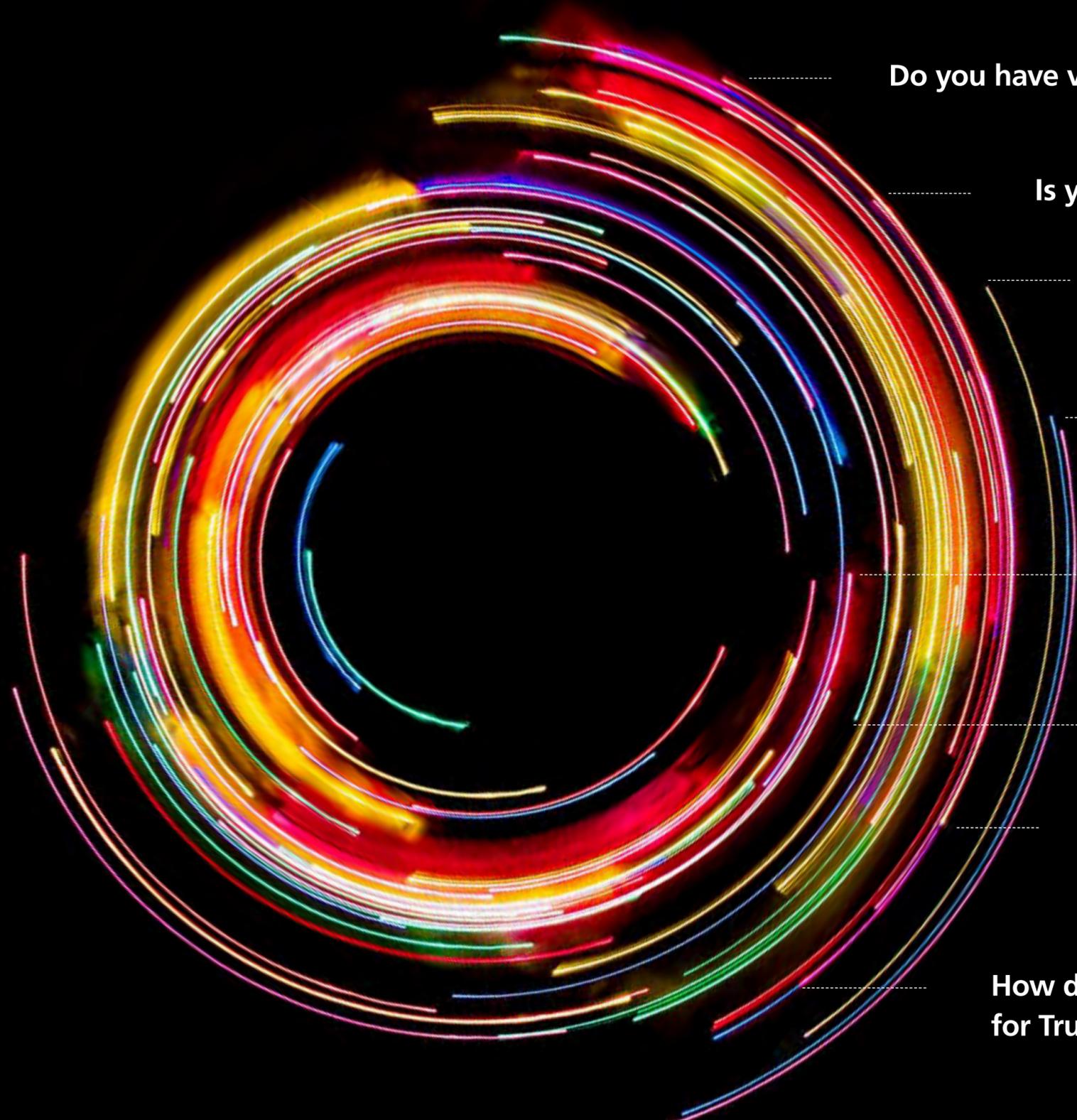


Do you have verification methods on your data sources?

Is your cybersecurity resilient enough to support your data?

Are there mandatory ethical standards in your data usage?

Do you use assessments to identify benefits/negative impacts, and mitigate risks?

Do you have processes that identify bias or discrimination in algorithms?

Are your data governance framework and data protection rights policies adequate?

Are your data processing methods accessible and understandable?

How do you address the key requirements for Trustworthy AI?

# AI in focus
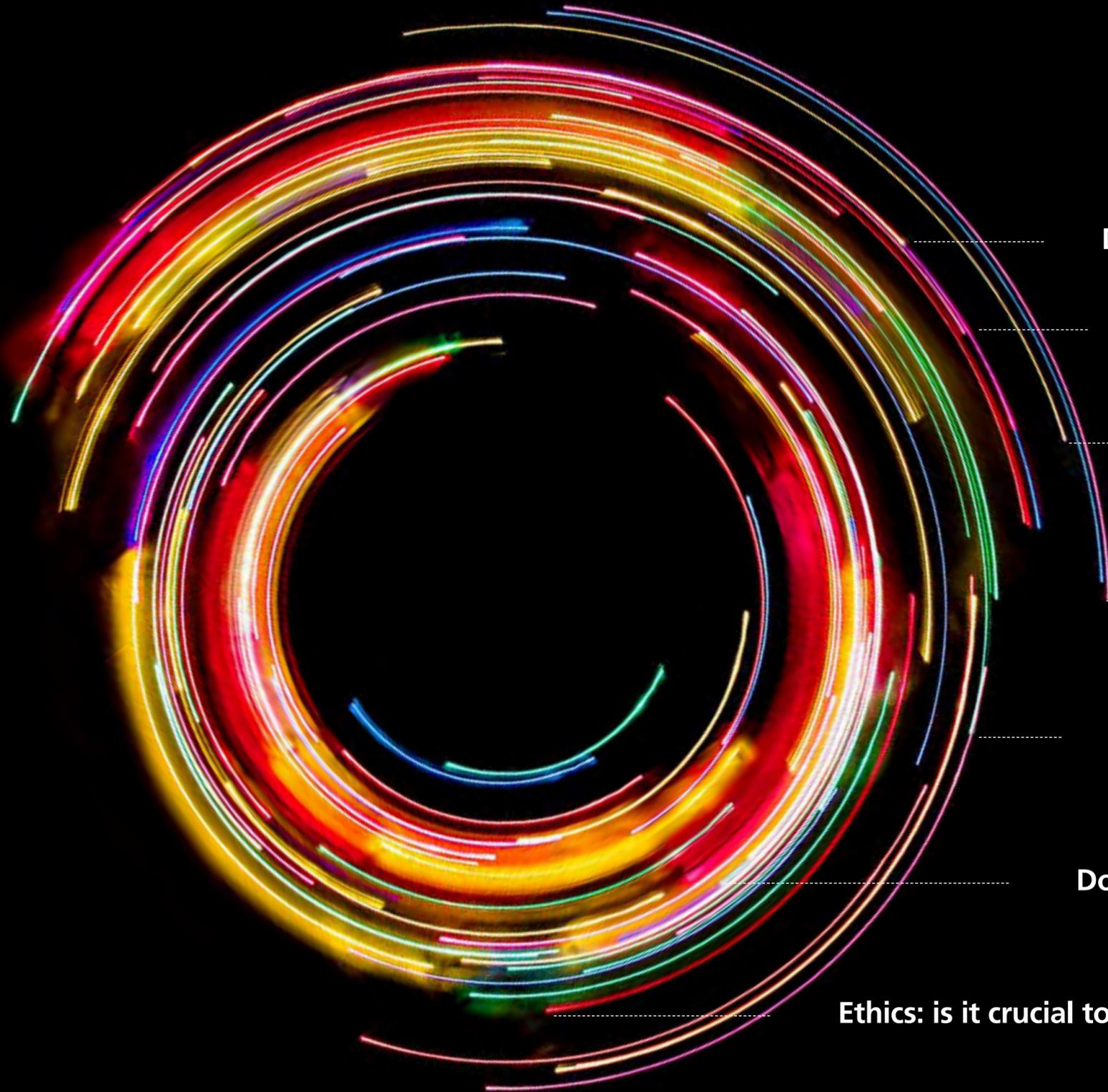


Do your contractual liability clauses cover AI usage?

Have you done a due diligence of data used by AI systems?

Can AI algorithms ensure data processing avoids competition law risks?

Is AI protected against cyber risks and who bears liability for an incident?

Does AI create any IP? Do you have a legal solution for that?

Does your professional liability insurance cover AI usage?

Ethics: is it crucial to use AI technology in a project?

# Smart technology in focus
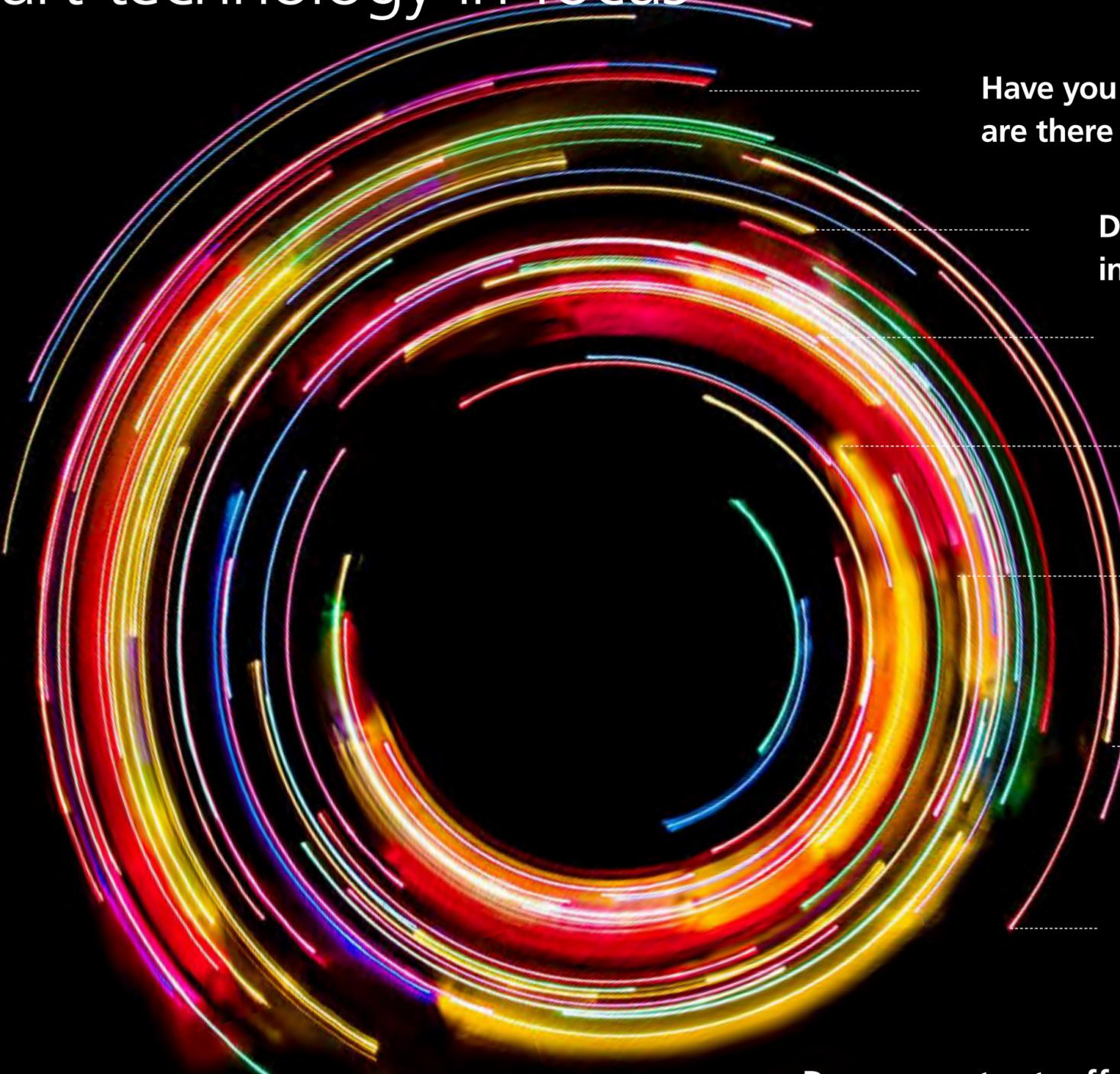
Have you reviewed your Business Continuity and Disaster Plans – are there AI or smart technology related issues and processes?

Does your Incident Management Plan include AI/smart technology incidents, events?

Do you have policies, principles and processes for AI-driven decision making?

Do you plan an impact and risk assessment on AI/smart technologies and legal/ ethical issues?

Have you checked your liability insurance: does it cover the use/provision of AI/smart technology?

Have you reviewed other policies – do they cover AI liability issues and contain processes for avoiding biases?

Have you checked your products/solutions that use AI or smart technologies: are they patentable/copyrightable? Do you have a policy to ensure their patentability?

Do your contracts affect AI and smart technologies cover liability issues?

# Stress-test: data centres in focus
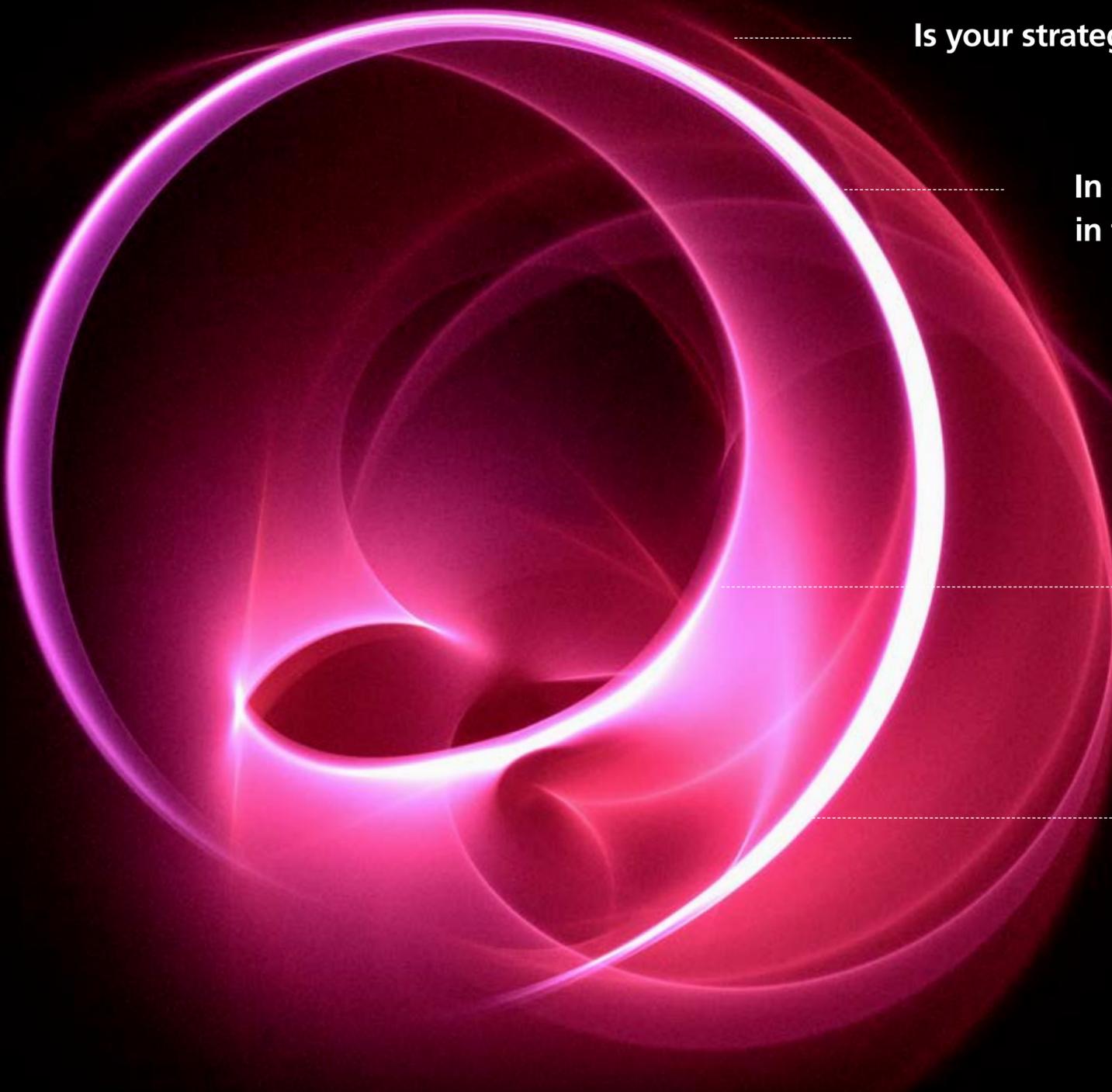
Is your strategic planning sufficient to meet your data centre needs?

In developing your data centres, are you getting the best value in terms of energy and labour costs?

How important are operational and cost efficiencies in your strategic planning as regards data centres?

In deciding on the location of your data centres, how important is access to highly skilled labour?

Are you aware of the favourable tax regimes and other investment incentives in some CEE countries?

# Talk through your digital strategy with us

If you would like to consult on or stress-test your business' digital strategy with your local CMS experts, please do get in touch with us.

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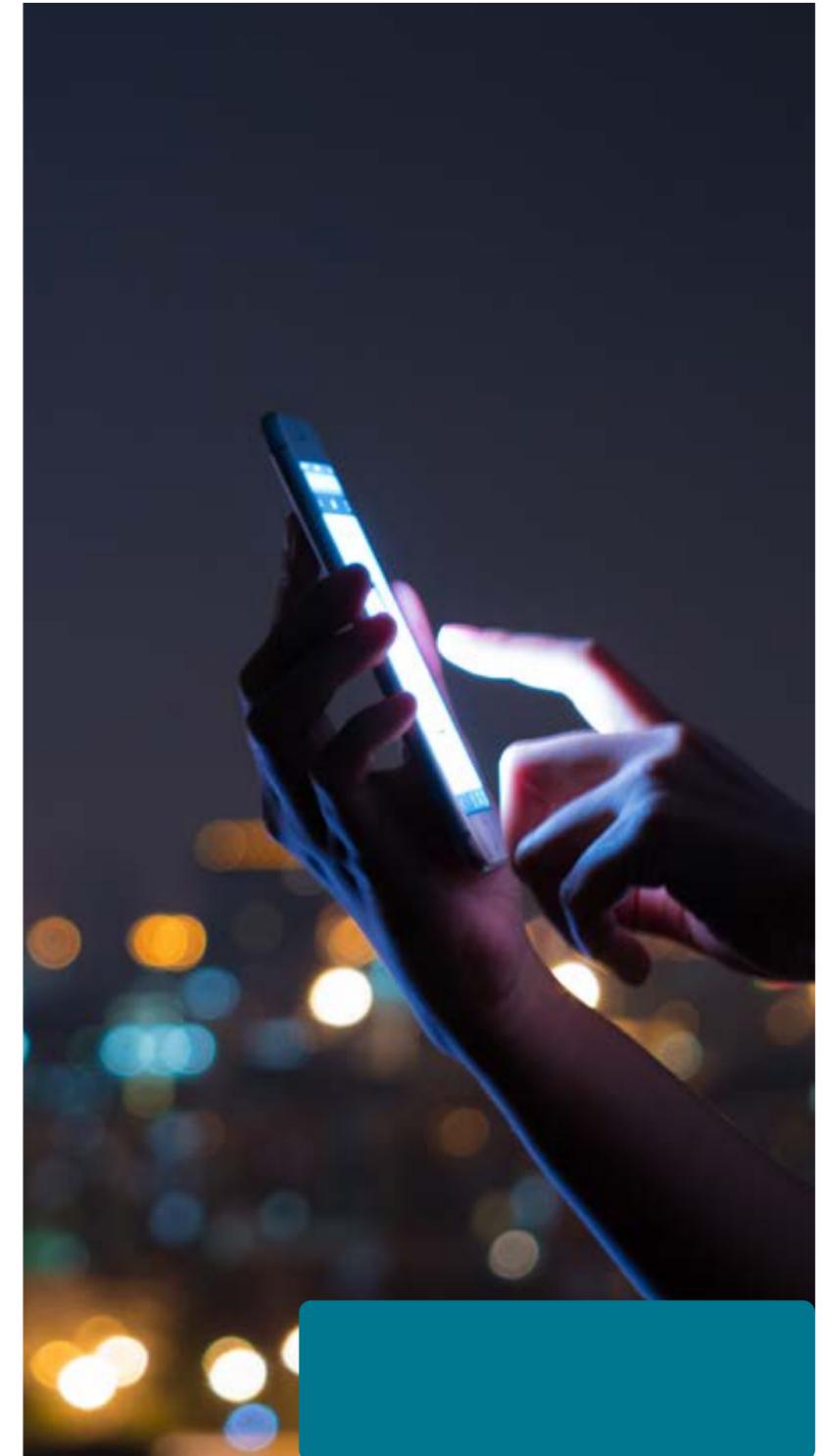
# Methodology

**18** countries in CEE

**c100** participants

**Digitalisation strategies**

**Investment plans**

**Regulation and risk**

As part of this series of Digital Horizons reports, a survey was conducted by CMS in July-August 2020. The survey canvassed the views of nearly 100 participants whose operations span 18 countries across the CEE region: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine.

In seeking the views of senior professionals in business/management, IT/IT Security and legal/compliance, a broad range of sectors were included: aviation, consumer products, energy, financial services, hotels & leisure, life sciences & healthcare, manufacturing, private equity, professional services, real estate, and TMT.

Respondents were asked questions focussed on a range of topics in relation to their digitalisation activities and priorities, which together form part of their strategic digital agenda. These include: AI, data analytics, ethics, IT investment plans, 5G, operational and legal risk, as well as regulation and compliance.

The data included in this report is drawn entirely from this survey. The research and writing of this report was conducted in collaboration with Dominic Carman, journalist and writer.

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