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Digitization and
Sustainability:
Practical Convergences of
Two Leading Discussions
in Business Law

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**Digitization and Sustainability:
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in Business Law**

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Abstract

Until now, digitization and sustainability have stood side by side in the discussion of business law. As leading discourses of the present-day business scene, both topics are leading to profound change in companies and are influencing each other in the process – a circumstance that can no longer be ignored by corporate management. The article shows the guiding ideas behind both discussions, as well as their convergences and interactions, and asks about the effects they have on management’s duty to act.

Bislang stehen Digitalisierung und Nachhaltigkeit in der wirtschaftsrechtlichen Diskussion allzu oft nebeneinander. Als Leitdiskurse der Gegenwart führen beide Themen jedoch zu tiefgreifenden Veränderungen in Unternehmen und beeinflussen sich dabei gegenseitig – ein Umstand, den Unternehmensführungen nicht länger ignorieren können. Der Beitrag zeigt die Leitideen der beiden Diskurse, ihre Konvergenzen und Wechselwirkungen auf und fragt nach den Auswirkungen auf die Handlungspflichten des Managements.

A. Two leading discourses in corporate and commercial law

I. Dominance and unifying element in social discourse

Today, the topic of sustainable business occupies the law more than ever before. However, sustainability has long been a central topic of social discourse. For example, the *Club of Rome* published its well-known report on the „Limits to Growth“ as early as 1972,¹ and the *Brundtland Commission* developed a concept for sustainable development for the United Nations in 1987.² In 1992, the international community placed the principle of sustainable development at the forefront and expressed a will to use the earth’s resources responsibly out of consideration for future generations with the UN’s Rio Declaration on Environment and Development.³ Since 2015, this declaration of intent has been detailed in the form of 17 globally applicable Sustainable Development Goals (SDGs).⁴ The focus of the UN Agenda 2030 is, above all, the defining and providing guidelines from implementing sustainability.

Nevertheless, despite elaboration from expert commissions and regulatory processing in social and legal discourse, the concept of sustainability is still often being regarded as diffuse, which is why it is worth briefly situating it here by way of introduction. The *Brundtland Commission* defines sustainability as development „that meets the needs of the present

¹ *Meadows et al*, The Limits to Growth.

² Report of the World Commission on Environment and Development: Our Common Future, 20 March 1987, available at <<https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>> (last accessed 15 February 2024).

³ Rio Declaration on Environment and Development, 1992, available at: <<https://www.un.org/depts/german/conf/agenda21/rio.pdf>> (last accessed 15 February 2024).

⁴ *United Nations*, Changing our world: the 2030 Agenda for Sustainable Development, December 25, 2015, UN Doc. A/RES/70/1/L.1, available at <<https://sustainabledevelopment.un.org/post2015/transformingourworld>> (last accessed 15 February 2024); on this, *Fischer*, Corporate Sustainability Governance, 2017, 36 et seq.

without compromising the ability of future generations to meet their own needs“.⁵ The various dimensions of this development mandate are systematized here under the axes of ecology and social conditions. Given the stagnation of sustainable development, the general „sustainability gap“⁶ remains a major problem, as the overconsumption of natural resources and the resulting harmful consequences threaten the foundations of our existence and those of future generations.

Parallel to the development of the concept of sustainability is the increasing spread of digital technology in all areas of life. Information and communication technologies have ushered in a new „digital age,“⁷ encompassing a plethora of networked processes. Big Data applications such as the analysis of gene sequences, personal health data, phone records or social media profiles have changed the way people interact with each other and with their natural environment.⁸ Digital technologies undoubtedly offer new opportunities and ways to shape society, science, and the economy.⁹ The most prominent phenomenon here is the platform economy, which has spawned powerful intermediaries for important services in the information society.¹⁰ Increased algorithmic capacities¹¹ enable the processing and analysis of data with unprecedented predictive capabilities and thus even a „time ontological shift.“¹²

In this context, digitalization has enormous potential to influence sustainability in the ecological and social system.¹³ IT technologies and Big Data applications can promote the social, economic, and ecological goals of sustainability¹⁴ by capturing and informationally linking the complex systems of society and ecology. While this cannot eliminate the natural interdependence of different systems, it opens a previously unimaginable scope for human action.¹⁵

As the two trends of sustainability and digitization are already fundamentally changing our world, they feature prominently on the agendas of national and European legislators. There are extensive political programs for both topics – for example, many governments

⁵ *UN General Assembly*, Report of the World Commission on Environment and Development: Our Common Future, December 11, 1987, UN Doc. A/RES/42/187, Chapter 2, 24: Towards Sustainable Development: „Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.“

⁶ *Lubin/Esty*, MIT Sloan Management Review, 55 (June 2014).

⁷ On the comprehensive transformation processes, see e.g. *Castells*, The Rise of the Network Society, 66 ff.; *Schmidt/Cohen*, The new digital age. Reshaping the future of people, nations and companies.

⁸ *Boyd/Crawford*, Information, Communication & Society 15 (2012), 662.

⁹ *Shah/Cappella/Neuman*, The ANNALS of the American Academy of Political and Social Science 659 (2015), 6–13.

¹⁰ *Parker/Van Alstyne/Choudary*, Platform Revolution; *Zuboff*, Journal of Information Technology 30 (2015), 75; on the economic foundations of the platform economy, *Tirole*, Économie du bien commun, chapitre 14; *Evans/Schmalensee*, in: *Blair/Sokol* (eds.), The Oxford Handbook of International Antitrust Economics, 404, 408 et seq.

¹¹ *Moore*, Electronics 38 (1965), 114.

¹² *Seele*, Journal of Cleaner Production 136 A (2016), 65.

¹³ On systems thinking, see e.g. *Luhmann*, Das Recht der Gesellschaft, 76 ff.

¹⁴ *Gijzen*, Nature 502 (2013), 38; *Hampton/Strasser/Tewksbury/Gram/Budden/Batcheller/Dukel/Porter*, Frontiers in Ecology and the Environment 11(2013), 156; with this three-step also *Helbing*, in: Ball, Why society is a complex matter, p. 55.

¹⁵ *Helbing*, in: Ball, (footnote 14), 55.

have presented a digitization strategy;¹⁶ on sustainability, the German Council for Sustainable Development was founded in 2001; in addition, the German government adopted a national sustainability strategy for the first time in 2002, which is regularly updated to reflect international developments.¹⁷ At the European level, the same picture emerges – on May 6, 2015, the EU Commission presented its Strategy for a Digital Single Market for Europe¹⁸ as a further development of the Digital Agenda for Europe of 2010.¹⁹ The EU is also pursuing a holistic sustainability concept in light of the UN's 17 Sustainable Development Goals.²⁰

II. Sustainability and digitization in business law

Business law shows a parallel between the political and social discourse on sustainability and digitization, which is not surprising given the obvious interconnectedness of the social systems of law, science, and politics. What is remarkable, however, is the intensity and depth with which sustainability and digitization are currently shaping business law.²¹ There is hardly an area of regulation that does not consider both topics, and the broad impact this has often connects areas of law that have not yet been connected in this form - such as corporate, contract, banking, and capital market law – but which thus also become caught up in the bipolar tension between digitization and sustainability.²²

At the same time, the discussions appear at first glance to be unconnected and are even being conducted in increasingly unconnected journals.²³ This is probably appropriate considering the wealth of material but leads to further division. The aim of this paper is to bring together the central ideas of the discussions on sustainability and digitalization in business law by first treating the two strands individually (here under 3. and 4.), and then outlining their convergences (II.) and interactions (III.). The high practical relevance of this connec-

¹⁶ Most recently, August 2022, „Digital Strategy - Creating Digital Value Together“, 25 April 2023, available at <<https://bmdv.bund.de/SharedDocs/DE/Anlage/K/presse/063-digitalstrategie.pdf>> (last accessed 15.02.2024).

¹⁷ Most recently, the German Sustainability Strategy 2021, published by the German Federal Government, cabinet decision of March 10, 2021. After the last fundamental revision in 2016, it takes into account possible improvements for the implementation and realization of the United Nations 2030 Agenda for Sustainable Development of September 2015.

¹⁸ Strategie für einen digitalen Binnenmarkt für Europa, COM(2015) 192 final. {SWD(2015) 100 final}, 6.5.2015, available at <<https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:52015DC0192&from=PT>> (last accessed 15.02.2024).

¹⁹ A Digital Agenda for Europe, COM(2010)245, 19.5.2010, available at <<https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:52015DC0192&from=PT>> (last accessed 15.02.2024); the eEurope 2002 (COM(2000) 330) and eEurope 2005 (COM(2002) 263) programs had been adopted earlier.

²⁰ Overview and documents available at <https://commission.europa.eu/strategy-and-policy/sustainable-development-goals/eu-whole-government-approach_en> (last accessed 15.2.2024).

²¹ On this already (mainly from a regulatory perspective) *Zech*, ZfDR 2022, 123.

²² This was also recently the case in the EU Commission's proposal for a new product liability directive, COM (2022) 495 final, 28.9.2022, available at <<https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A52022PC0495>> (last accessed 15.02.2024), see also *Seehafer*, DB 2022, 3037.

²³ For the law of digitalization, for example, the ZfDR, RDi, MMR and CR should be mentioned; for sustainability law, for example, the KlimaRZ, KlimR, ESGZ and NR; exemplary for the separate treatment of the topics are also the contributions in *Böffel/Schürger*, Digitalization, Sustainability and the Banking and Capital Markets Union.

tion was also recently recognized by the German government in its digital strategy of August 31, 2022.²⁴

III. Guidelines of the Discussion on the Digitization Act

The focal points of legal acts on digitalization are closely linked to central economic and technical phenomena, i.e. platforms, data, „artificial intelligence“ (AI),²⁵ decentralized communication systems, and digital currency units (mostly related to the blockchain). For each of these current phenomena, the guiding principles on digitalization can be grouped around the three fundamental institutions of private law – property, contract, and liability.²⁶

Apparently, much to the chagrin of institutional aesthetics, digital contracts have found their way into §§ 327 et seq. of the German Civil Code, as part of the 2019 EU reform package²⁷ Here, primary and secondary performance obligations have been adapted to the specifics of immaterial services and the consideration of the basic model of „performance against data“; in this context, the merging of contract law with the General Data Protection Regulation still raises difficult questions.²⁸ The treatment of the platform economy in this regulation focuses not only on antitrust aspects to preserve the contractual balance between users and platform operators, but also on the allocation of responsibility in user relationships.^{29/30} Liability also plays a central role in the use of AI. Here, the main issue is the allocation of responsibility in diffuse constellations with numerous actors and indirect causes, especially in autonomous driving, but certainly also in financial services, the production of journalistic texts, and generally in the design of user interfaces in social media and e-commerce.³¹ Particular liability issues also arise with other technologies, such as blockchain³² and computerized data processing (*Big Data*).³³ The novelty and scope of technological functions do not preclude processing under the established categories of liability law, which is a central aspiration of jurisprudential discourse.³⁴ The European legislator has most recently confirmed this with a draft tightening of the Product Liability Directive, in which

²⁴ Strategie für einen digitalen Aufbruch, 25 April 2023, available at <<https://www.bundesregierung.de/breg-de/themen/digitaler-aufbruch/digitalstrategie-2072884>> (last accessed 15 February 2024).

²⁵ On the term *Spieker gen. Döhmann*, CR 2016, 698 (701); on the technical principles in detail *Russell/Norwig*, Artificial Intelligence, A Modern Approach, 3rd ed. 2016, 7 ff.

²⁶ On this three-pillar structure, see *Eucken*, Grundzüge der Wirtschaftspolitik, 1952, especially book 4.

²⁷ Directive (EU) 2019/770 of the European Parliament and of the Council on certain aspects concerning contracts for the supply of digital content and digital services, ABL L 136 from 22.5.2019, p. 1–27, available at: <<https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A32019L0770>> (last accessed 15.02.2024).

²⁸ For a monograph, see *Hacker*, Datenprivatrecht; *Sattler*, Informationelle Privatautonomie, 2022.

²⁹ *Schweitzer*, ZEuP 2019, 1; *Schweitzer*, in: Kühling/Körber, Regulation, Wettbewerb, Innovation, 269; *Mohr* ORDO 69 (2018), 259 (295); *Denga*, ZGE 2020, 1 (13 f.); on the DMA, see *Podszun/Bongartz/Kirk* NJW 2022, 3249.

³⁰ For trading platforms *Engert*, AcP 218 (2018), 304 (311 f.); comprehensively *Vilgertshofer*, Online-Plattformen und vertragliche Haftung, 67 f.; for content platforms *Spindler* MMR 2018, 48; *Wagner* GRUR 2020, 329 and 447.

³¹ See in each case with further references §§ 15, 29, 30 in: *Ebers/Heinzel/Krügel/Steinrötter* (eds.), Künstliche Intelligenz und Robotik, 2020; on the convergence of liability regulation and media law, *Kalbhenn* ZUM 2021, 663.

³² *Kuntz*, AcP 220 (2020), 51 (70 ff.); *Denga*, JZ 2021, 227 (229 f.); *Denga*, ZBB 2022, 298 (303 f.).

³³ *Kirchner*, InTer 2018, 19, 59.

³⁴ *Grundmann*, in: MünchKommBGB, § 276 Rn. 110 f.

software and AI are now also covered, and IT security is counted among the legitimate security expectations of the legal community.³⁵

In the field of intellectual property, the discussion focuses on the formation of absolute positions on information,³⁶ the infringement of which then also becomes relevant in terms of liability law. Here, digital means of communication open up new and more intensive possibilities for the use of protected works and rights, which often elude effective control by those entitled to them.³⁷ In addition, the use of complex algorithms to create content is in question, especially regarding the entitlement to the products of „intelligent“ tools such as ChatGPT.³⁸ In corporate law – which stands alongside the triad of property, contract, and liability as an organizational order – the constitution of societies in virtual space and diffuse contexts is central; for example in the use of the catchphrase „DAO“ (Decentralized Autonomous Organization), as well as the testing of digital means of communication and assembly.^{39,40} The discussion about the duty to use technology (especially AI) in corporate law, which derives from the Business Judgement Rule and its requirement of an adequate information basis, as well as from the duty of management bodies to achieve corporate goals in the best possible way, continues to be influential.⁴¹

IV. Guidelines of the sustainability law discourse

The sustainability discussion in business law focuses on the responsibility of companies for ecological and social concerns, incorporated initially under the term Corporate Social Responsibility (CSR).⁴² A central building block for the implementation of social and ecological goals in corporate activities has been reporting obligations on the company's own sphere of influence and the subsequent impact on social goods, which are intended to indirectly create incentives for companies to remedy grievances without imposing concrete obligations to act.⁴³ Behavioural regulation through information obligations is thus intended to

³⁵ Proposal for a Directive of the European Parliament and of the Council on liability for defective products, COM(2022) 495 final, 29.09.2022, available at: <<https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A52022PC0495>> (last accessed 15.02.2024).

³⁶ In this regard, *Zech*, Information als Schutzgegenstand, esp. second part; *Schweitzer* GRUR 2019, 569; most recently *Becker*, Absolute Herrschaftsrechte, esp. §§ 5 et seq.

³⁷ In this regard, *Peukert*, GRUR-Beil. 2014, 77; *Leistner* ZUM 2016, 580; *Metzger* ZUM 2018, 233.

³⁸ In this context, *Dornis*, GRUR 1252; *Bridy*, 2012 STAN. TECH. L. REV. 5.

³⁹ See below, III., 2., c).

⁴⁰ *Mann*, NZG 2017, 1014; *Schwemmer*, AcP 221 (2021), 555.

⁴¹ Cf. *Zetzsche*, AG 2019, 1 (6 f.); *Noack*, ZHR 183 (2019), 105 (121 f.); *Spindler* CR 2017, 715 (723); *Spindler*, ZGR 47 (2018), 17 (42 f.); *Möslein*, ZIP 2018, 204 (209); see also: *Spindler*, in: MünchKommAktG, § 93 Rdnr. 56; specifically for transactions: *Hacker/Krestell/Grundmann/Naumann*, Artif. Intell. Recht 28 (2020), 415, 425 et seq.

⁴² Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large companies and groups, ABl. L 330/1 from 15.11.2014, S. 1–9, available at: <<https://eur-lex.europa.eu/eli/dir/2014/95/oj>> (last accessed 15.2.2024); CSR reporting requirements are implemented centrally in the German Commercial Code under sections 289b–e. For an overview including contextualization, *Mittwoch*, Sustainability and Corporate Law, 2022, 163 ff.

⁴³ For example, *Bachmann*, ZGR 2018, 231 (233 f.); on indirectness above all *Hommelhoff*; in: Festschrift für Kübler, 291; *ibid.*, NZG 2015, 1329 (1330); *ibid.*, in: Festschrift für Hoyningen-Huene, 137 (140).

have an effect on the information producer itself,⁴⁴ in particular through the *comply-or-explain mechanisms* prescribed since 2017 in Section 289c (4) of the German Commercial Code (HGB)⁴⁵ on the basis of the EU non-financial reporting directive (NFRD).⁴⁶ These individual non-financial reporting requirements will now be updated in favour of comprehensive sustainability reporting.⁴⁷ As a result, the product and capital markets will benefit from the information made available and be able to align their purchasing and investment decisions with social and environmental standards, which should lead all suppliers to adopting the guiding principle of a „socially and solidarity-oriented company“⁴⁸ without neglecting the ecological dimension of sustainability. Building on the EU Commission's action plan for financing sustainable growth, the financial markets are also subject to their own far-reaching sustainability-promoting regulation via the instrument of information requirements.⁴⁹ Unlike in the field of sustainability reporting and supply chain regulation, the ecological dimension of sustainability has dominated the central legal acts in the realm of sustainable finance to date.⁵⁰

However, reporting obligations are only able to provide significant improvement for sustainability aspects in conjunction with enforceable legal protection guarantees. Such legal protection guarantees have long been called for by international standards, including

⁴⁴ On the information model, *Fleischer*, Informationsasymmetrie im Vertragsrecht, 203–208, 570–572; *Kerton/Bodell*, Journal of Consumer Affairs 29 (1995), 1 (esp. 20–24); *Grundmann/Kerber/Weatherill* (eds.), Party Autonomy and the Role of Information in the Internal Market, (esp. Introduction); On the legal-economic as well as social-scientific perspective, e.g., *Hess*, Jour Corp Law 25 (1999), 41; *Buhmann*, BHRJ 3 (2017), 1 (23); *Habersack/Ehrl*, AcP 219 (2019), 155 (178); with first empirical results *European Commission*, Study on due diligence requirements through the supply chain, January 2020, 250, available at: <file:///C:/Users/anti2/Downloads/study%20on%20due%20diligence%20requirements%20through%20the%20supply-DS0120017ENN.pdf> (last accessed: 15.02.2024).

⁴⁵ Cf. *Hommelhoff*, ZGR 2017, 1361 (1362). Although the relevant information is not subject to the audit of the financial statements pursuant to section 317 (2) sentence 4 HGB, it must be audited by the supervisory board; on the controversial auditing standard *Mock*, ZIP 2017, 1195; *Hennrichs/Pöschke*, NZG 2017, 121 (127); *Rieckers*, DB 2019, 107 (108); also *Röttgen/Hund*, DK 2019, 201 (207).

⁴⁶ See Fn. 42.

⁴⁷ Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014 and Directives 2004/109/EC, 2006/43/EC and 2013/34/EU as regards corporate sustainability reporting, ABl. L 322 from 16.12.2022, S. 15–80, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3A0J.L_.2022.322.01.0015.01.ENG&toc=OJ%3AL%3A2022%3A322%3ATOC> (last accessed 15.2.2024).

⁴⁸ In this regard, e.g. A renewed EU strategy 2011–14 for Corporate Social Responsibility, COM(2011), 25.10.2011, 681, 10f, available at: <https://www.europarl.europa.eu/meetdocs/2009_2014/documents/com/com_com(2011)0681_/com_com(2011)0681_en.pdf> (last accessed 15.2.2024), as the basis of Directive 2014/95/EU; in this regard also *Wagner*, RabelsZ 80 (2016), 717 (779 f.); *Habersack/Ehrl* AcP 219 (2019), 157 (203 ff.); *Asmussen*, Haftung für CSR, 2020, 14 ff.

⁴⁹ Commission Action Plan: Financing Sustainable Growth, COM(2018) 97 final, 8.3.2018, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0097> (last accessed 15.2.2024); on the research and regulatory area Sustainable Finance *Mittwoch* (fn. 42), 192 ff.; *Bueren*, ZGR 2019, 813.

⁵⁰ In particular, the Taxonomy and Disclosure Regulation, Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 establishing a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088, ABl. L 198, 22.6.2020, S. 13–43, available at: <https://eur-lex.europa.eu/eli/reg/2020/852/oj> (last accessed 15.2.2024) and Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosure requirements in the financial services sector, ABl. L 317, 9.12.2019, S. 1–16, available at: <https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=CELEX%3A32019R2088> (last accessed 15.2.2024).

by the – admittedly non-binding – UN Guiding Principles on Business and Human Rights,⁵¹ which incorporate various connecting factors including declaratory liability⁵² from the adoption of private self-regulation⁵³ or unfair competition.⁵⁴ However, a liability component to reporting obligations is problematic, since the contents to be reported and their presentation in Section 289c HGB are defined by numerous undefined legal terms (such as: „significant risks“, „serious negative effects“, „environmental concerns“, „employee concerns“, „social concerns⁵⁵“), which derive directly from Art. 1 No. 1 of the NFRD.⁵⁶

However, according to UN Guiding Principle No. 17, companies are subject to a general obligation of due diligence to identify and mitigate human rights violations which to the extent reasonable, includes their relationships with third parties, particularly suppliers. Guiding Principle No. 22 requires companies involved in human rights abuses to make reparations. However, the territorial effect of tort liability, which has increasingly advocated on this basis, already appears to be very limited in the international context, especially since Article 4(1) of the Rome II Regulation provides that the law of the place of performance applies to tortious acts. For this reason, the German Supply Chain Act (Lieferkettensorgfaltspflichtengesetz, in short LkSG) of 2021 expressly dispenses with liability under private law⁵⁷ and instead relies solely on procedural obligations for risk analysis and risk management, documentation, and publication of policy statements and reports, as well as a private complaints procedure and monitoring by the Federal Office of Economics and Export Control.⁵⁸ Instead of a duty to succeed, a graduated „duty of effort“ applies to the enforcement of human rights and environmental concerns in the supply chain.⁵⁹

It is noteworthy, however, that a tectonic shift could be observed at the European level, as the EU Commission was calling for a comprehensive corporate duty of care for managing directors and wanted to reinforce this with civil liability for third parties.⁶⁰ However, the

⁵¹ Available at <https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusiness_HR_EN.pdf> (last accessed 15 February 2024).

⁵² Cf. *Weller/Kaller/Schulz*, AcP 216 (2016), 387 (412 f.); *Wagner*, *RabelsZ* 80 (2016), 717 (777 f.); *Weller/Thomale ZGR* 2017, 509, 518; *Thomale/Hübner*, *JZ* 2017, 385 (395).

⁵³ This was most recently noted by the UK Supreme Court in *Lungowe v. Vedanta Resources*, [2019] UKSC 20, and *Okpabi v. Shell* [2021] UKSC 3; see, e.g., *Asmussen/Wagner*, *ZEuP* 2020, 979; *Beckers*, *ZfPW* 2021, 220 (244 et seq).

⁵⁴ Earlier already *Micklitz/Kesler GRUR Int* 2002, 885 (889 f.); *Kesler*, *WRP* 2007, 714 (720 f.); *Fezer*, *WRP* 2010, 577 (581); *Beckers*, *CMLR* 54 (2017), 475 (481); *Meier*, *GRUR* 2019, 581; critically *Alexander*, in: *MünchKommLauterkeitsrecht*, § 5a UWG Rn. 45; *Birk*, in: *Hilty/Henning-Bodewig*, *Soziale Verantwortung von Unternehmen – Verbindliche Standards für das Wettbewerbsrecht?*, 169 (181 et seq).

⁵⁵ For example, *Merkt*, in: *Hopt*, *Handelsgesetzbuch Kommentar*, 41st ed. 2022, § 289c marginal no. 13; *Böcking/Gros/Wirth*, in: *Joost/Strohn*, *Handelsgesetzbuch Kommentar*, 4th ed. 2020, § 289c marginal no. 30.

⁵⁶ In contrast, *Böcking/Gros/Wirth*, in: *Joost/Strohn* (footnote 55), § 289c marginal no. 8–17, present a convincing systematization.

⁵⁷ Cf. § 3 para. 3 LkSG: „A breach of the obligations under this Act does not give rise to civil liability. Civil liability established independently of this Act remains unaffected.“; differently still a strong demand in the preceding legal-political debate, on this *Kieninger*, *ZfPW* 2021, 252 (254).

⁵⁸ § 19 LkSG; critical of the case law *ibid.*, *ZfPW* 2021, 252 (253).

⁵⁹ On the dogmatic classification of the „effort obligation“ *Westphalen*, *ZIP* 2020, 2421 (2429 f.) also *Kieninger*, *ZfPW* 2021, 252 (253).

⁶⁰ Proposal for a Directive of the European Parliament and of the Council on corporate due diligence with regard to sustainability and amending Directive (EU) 2019/1937, COM(2022) 71 final, 23. 2. 2022, available at: <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0071>> (last accessed 15.2.2024); on this, *Mittwoch*, *NR* 2022, 149; *Hübner/Habrigh/Weller*, *NZG* 2022, 644; *König*, *NZG* 2022, 1186.

Council has opposed such a comprehensive approach, which also affects the core of company law and the duty of care for managing directors (Art. 25 and 26 of the draft) were deleted in the trialogue.⁶¹ However, the sustainability discussion also calls for the infrastructural function of corporate law when it comes to providing adequate legal forms for sustainable enterprises. In this vein, more and more legislators have introduced special legal forms similar to the US Benefit corporation; in Germany, the introduction of a so-called limited liability company (GmbH) with tied assets is currently being discussed.⁶²

Finally, the issue of sustainability goes far beyond corporate law and touches on sales law via, for example, corporate information duties since they constitute public statements that are relevant to warranties under Section 434 (3) No. 2 of the German Civil Code.⁶³ In addition, false statements about the „sustainability“ of a product (*greenwashing*) are also justifiable under the Unfair Competition Act.⁶⁴ An „ecological analysis“ of civil law in general is on the rise,⁶⁵ with the aim of reading existing legal remedies and legal institutions in the light of sustainability interests.

B. Convergences

I. Blur due to complexity

Structurally, some commonalities can be identified in the problems raised by the sustainability and digitization discussions. For example, both terms are *a priori* indistinct and are not often sufficiently specified in legal literature, which feeds the accusation of excessive politicization of the respective debates and makes legal certainty more difficult.

For example, in the discussion on digitalization law this deficit is openly visible in connection with the concept of sovereignty: through measures like the General Data Protection Regulation or the Digital Services Act, digital sovereignty emerges as the guiding principle of IT regulation despite the vagueness of the concept, which can lead to significant deficits in the balance of regulation and legal certainty. Particularly, regulation of digital markets is characterized by a desire to compensate for the disadvantages of the European economy in the IT sector.⁶⁶ Conversely, the jurisprudential discussion on digitalization law is characterized by narratives that are enthusiastic about technology, especially regarding the possibilities of AI and blockchain. – in this vein, a stronger reference to facts seems desirable.⁶⁷

⁶¹ Common Position of the Council of the European Union, 2022/0051(COD), 30.11.2022.

⁶² *Sanders/Dauner-Lieb/Kempny/Möslein/Veil*, Entwurf eines Gesetzes für die Gesellschaft mit beschränkter Haftung in Verantwortungseigentum, 12.6.2020, available at <<https://www.gesellschaft-in-verantwortungseigentum.de/der-gesetzesentwurf/>> (last accessed 15.2.2024); overview in *Mittwoch* (fn. 42), 254; cf. on the special suitability of the cooperative for sustainable management, see *Denga*, NZG 2022, 1179.

⁶³ On the broadness of the term „public statement“ *Faust*, in: BeckOKBGB, 64th ed., as of 1.11.2022, § 434 Rn. 104 ff; see also *Lüttringhaus* AcP 219 (2019), 29.

⁶⁴ In this regard, *Steuer*, GRUR 2022, 1408; from a capital market law perspective, *Möllers*, ZHR 185 (2021), 881; *Buck-Heeb*, BKR 2022, 747; cf. on the concept of commercial transaction *Peifer/Obergfell*, in: Fezer/Büscher/Obergfell, Lauterkeitsrecht: UWG, 3rd ed. 2016, § 5 para. 179.

⁶⁵ *Bach/Kieninger*, JZ 2021, 1088; on sustainability in the core area of private law already *Halfmeier*, AcP 216 (2016), 717; monographically most recently *Schirmer*, Nachhaltiges Privatrecht.

⁶⁶ On this, *Denga*, GRUR 2022, 1113; with an overview of the spread of the term *Roberts et al*, Internet Policy Review 10 (2021), 1 (4 f.); cf. *Peuker*, Verfassungswandel durch Digitalisierung, esp. ch. 3 and 4. From a political science perspective, see *Thiel*, in: Hofmann, Problemfelder und Forschungsperspektiven, 47; cf. also *Hilgendorf/Vogel*, JZ 2022, 380.

⁶⁷ On the myth of blockchain decentralization, for example, *Denga*, ZBB 2022, 298.

Sustainability also remains an undefined concept in too many statements and regulatory discussion. In most cases, the term is simply not further defined,⁶⁸ and sometimes, the regulatory goal of „sustainability“ is also used to justify reform efforts that are motivated by other factors. This is particularly true when it comes to the above mentioned limited liability companies with tied assets – in the case of the latter, it is extremely unclear what kind of responsibility is meant.⁶⁹ Nevertheless, sustainability, at least from an ecological perspective, is heading towards a very concrete goal: the preservation of human livelihoods within planetary boundaries.⁷⁰ Quantification is quite possible⁷¹ to the extent that, in principle, there will be no room for interpretation problems. Moreover, since the climate decision of the German Federal Constitutional Court, there is no longer any doubt that environmental sustainability binds not just the legislator, but also the other two state powers, and thus also dominates the application of private law.⁷² As a case of market failure, the climate crisis leads to a suppression of private autonomy.⁷³ Admittedly, there is even more ambiguity in the field of social and economic sustainability. This, together with the plethora of poorly-coordinated regulatory projects, leads to considerable implementation problems for practitioners.⁷⁴

II. Intra- and interdisciplinarity as well as internationality

When the discussions are considered together, another commonality stands out - they not only benefit from interdisciplinarity, but also urgently require interdisciplinarity to do justice to their complex nature. For example, no precise goals for sustainability can be set without a close look at research in the social and the natural sciences. This is demonstrated by the concept of planetary boundaries which establishes a ‚safe operating space‘ not only for economic actors, but ultimately for all human behavior.⁷⁵ The law of digitalization is practically driven by technological development, which means a closer look at technical functions is required for an appropriate solution.⁷⁶ Therefore, the mantra „courage for empiricism and interdisciplinarity“ should be adopted.

⁶⁸ For example, the proposal for a directive on corporate due diligence in the area of sustainability (see footnote 57) mentions the term sustainability exactly fifty times without offering a definition for it.

⁶⁹ *Schirmer*, ZEuP 2023, 326; more general criticism e.g. in *Arnold/Burgard/Roth/Weitemeyer*, NZG 2020, 1321; *Croon-Gestefeld*, KritV 2020, 351.

⁷⁰ Fundamental *Rockström/Steffen et al*, *Ecology and Society* 14 (2009), 32; *Rockström/Steffen et al*, *Nature* 461 (2009), 472 ff.; more recently *Richardson et al*, *Science Advances* 37, 9 (2023); from a legal perspective *Sjåffell/Bruner*, *Corporations and Sustainability*, in: *Sjåffell/Bruner* (eds.), *The Cambridge Handbook of Corporate Law, Corporate Governance and Sustainability*, 3, 7 et seq.

⁷¹ From a legal perspective, the Taxonomy Regulation with its sometimes very detailed requirements is of key importance, Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088, ABl. L 198, 22.6.2020, S. 13–43, available at: < <https://eur-lex.europa.eu/eli/reg/2020/852/oj> > (last accessed 15.2.2024); to which *Bueren*, WM 2020, 1611 and 1659.

⁷² *BVerfGE* 157,30, in addition *Faßbender* NJW 2021, 2085 (2087); *Calliess*, ZUR 2021, 355 (357); *Muckel*, JA 2021, 610 (613).

⁷³ On the concept of market failure, see, e.g., in *Mestmäcker*, JZ 1964, 441 (443); *Hellgardt*, *Regulierung und Privatrecht*, 444 et seq.

⁷⁴ In this context, *Mittwoch/Wetenkamp/Bleier*, NJW 2022, 3601.

⁷⁵ See fn. 70.

⁷⁶ Taking contract law as an example, *Grünberger*, AcP 218 (2018), 213 and *Grundmann/Hacker*, ERCL 2017, 13 (2013), 255; on technology control, *Zech*, *Einführung in das Technikrecht*, 3 ff.; more generally, *Maume*, BKR 2022, 640.

The plea for strong interdisciplinarity is complemented by that of intradisciplinarity; this is supported by an increasing convergence of public and private law, especially considering that the EU as a regulatory authority does not orient itself to the national classifications of public and private law anyway, a circumstance that can already be observed prominently in capital market law or consumer law.⁷⁷ The interests of sustainability and digitization are regulated partially by administrative action, but also by empowering the private sector. This is evident in data law, where a melange of regulatory and private enforcement and design prevails, as well as in the⁷⁸ proposal for a Corporate Sustainability Due Diligence Directive (CSDDD), which calls for a combination of public and private enforcement.⁷⁹

Finally, both discussions are strongly driven by international legislation – national law can only selectively set accents here, as the German Electronic Securities Act (Gesetz zur Einführung elektronischer Wertpapiere, eWpG)⁸⁰ or the German Supply Chain Act (LkSG)⁸¹ do. In general, however, digitization law is European in character,⁸² and sustainability law is additionally influenced by soft law at the international level (particularly by the UN Global Compact,⁸³ UN Guiding Principles⁸⁴ or OECD guidelines).⁸⁵

Both discussions raise the fundamental question of whether special rules are needed to solve regulatory problems or whether the general rules are sufficient. In the digitalization discussion, the question of the ‚law of the horse‘ has been dominated by *Lessig in* favor of special rules for the architecture of information technology and, moreover, prominently answered,⁸⁶ especially by *Pasquale* and *Zech* for data⁸⁷. In sustainability law, there have been repeated attempts to activate general business management duties under the concept of corporate interest or even the figure of the „honorably businessman“. ⁸⁸ In both areas, the European legislator has clearly decided the core compromise between legal certainty and flexibility in favor of the former and has thus paved the way for special legislation.

⁷⁷ See, e.g., *Poelzig*, Normdurchsetzung durch Privatrecht; *Franck*, Marktordnung durch Haftung, 2016; *Hellgardt* (fn. 73).

⁷⁸ Art. 82(1); Art. 83(1); Art. 84 GDPR, cf. *Nemitz*, in: Ehmann/Selmayr, Datenschutz-Grundverordnung, Art. 83 (1).

⁷⁹ *Burgi*, ZHR 186 (2022), 779; *Hübner/Habrigh/Weller*, NZG 2022, 644 (648 et seq.).

⁸⁰ In this regard, *Mittwoch*, WM 2021, 375; *Lehmann*, NJW 2021, 2318.

⁸¹ In this regard, *Mittwoch/Bremenkamp* KritVZ 2021, 207.

⁸² See *European Commission*, Strategy for a Digital Single Market for Europe, COM(2015) 192 final, 6.5.2015, available at: <<https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:52015DC0192&from=PT>> (last accessed 15.2.2024).

⁸³ Cf. <https://www.unglobalcompact.org>.

⁸⁴ UN, Guiding Principles on Business and Human Rights: Implementing the United Nations „Protect, Respect and Remedy“ Framework, see Resolution 17/4, 6.7.2011, UN Doc. A/HRC/RES17/4, available at <<https://documents.un.org/doc/resolution/gen/g11/144/71/pdf/g1114471.pdf?token=naBqyJtlbD-wXOWvzAa&fe=true>> (last accessed 15.2.2024).

⁸⁵ OECD, Declaration on International Investment and Multinational Enterprises, 21.7.1976; current version: OECD Guidelines for Multinational Enterprises, 25.5.2011.

⁸⁶ *Lessig*, Code and other laws cyberspace, 1999, *Lessig*, Harvard Law Review 113 (1999), 149 ff.; the term „law-of-the-horse“ has been used since the mid-1990s in connection with the development of a law of digitalization.

⁸⁷ *Pasquale*, The Black Box Society; *Hürlinmann/Zech*, Rechte an Daten, sui-generis 2016, 89 (92 ff.); on the sociology of technology, for example, *Häußling*, Soziale Welt Sonderband 23 (2020), 134.

⁸⁸ See also *Schubert*, Das Unternehmensinteresse – Maßstab für die Organwalter der Aktiengesellschaft; in more detail also *Mittwoch* (fn. 42), 330 et seq.

C. Interactions

The two discussions are indeed intertwined. Digitization challenges sustainability and must be oriented by sustainability goals. Conversely, means of digitization can enable sustainability, so sustainability requires orientation to the means of promoting digitization. Thus, the goals of one strand of discussion are each facilitated, or complicated, by those of the other. This intertwining has implications both for law-making and the application of law. This will be demonstrated utilizing three examples: first, by considering the limiting effect of sustainability on digitization (1.), then by examining the enabling effect of digitization on the goals of sustainability (2.).

I. Sustainability goals for digitization

1. *Ecological blockchain applications*

In principle, documentation using blockchain technology offers considerable potential for the economical use of storage capacity, since only short sequences of numbers („hash values“) that refer to locally-stored data are stored in such systems. However, the decentralized validation mechanism through extensive computing power too often proves problematic from the point of view of resource consumption and environmental compatibility, namely when, as in the case of the Bitcoin blockchain, the proof-of-work procedure is used. It has long been known that this continuously consumes about as much electricity as the entire Republic of Ireland-about three gigawatts over the course of a year.⁸⁹ Of course, generalizations are forbidden because blockchain platforms rely on different validation algorithms that require different amounts of energy. Thus, there are also significant differences in the proof-of-work process itself.⁹⁰ The proof-of-stake process is also a far more energy-efficient variant, which is now also used by the large platform Ethereum.⁹¹

The high resource-intensity of certain blockchain applications also has legal implications from an environmental sustainability perspective.⁹² During regulatory discussions on a financial market regulation for crypto-assets, which merged into MiCAR,⁹³ banning the proof-of-work process completely as the technical basis of financial instruments was proposed. Presumably, in the future, all consensus mechanisms used to validate crypto-asset transactions will need to be screened for negative climate and environmental impacts.⁹⁴

⁸⁹ *O'Dwyer/Malone*, Bitcoin Mining and its Energy Footprint, ISSC 2014/CIICT2014; more gloomy, but ultimately not reality, is the World Economic Forum's 2017 projection that Bitcoin would equal global electricity consumption by 2020, see <https://www.weforum.org/agenda/2017/12/bitcoin-consume-more-power-than-world-2020/> (last accessed 15.2.2024); more optimistic *Taudes*, Audit Committee Quarterly II/2022, 18.

⁹⁰ *Ganne*, Can Blockchain Revolutionize International Trade?, 92 ff.

⁹¹ On validation mechanisms, see also *Denga* JZ 2021, 227 (230 f.); *Denga* ZBB 2022, 298 (299); *Schlund/Pongratz*, DStR 2018, 598.

⁹² See most recently *Jones/Goodkind/Berrens*, Scientific Reports 12 (2022) 14512.

⁹³ Regulation (EU) of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937, ABl. EU Nr. L 287, 29.10.2013, S. 63, available at: < <https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32010R1093> > (last accessed 15.2.2024).

⁹⁴ See Recital 5a, Art. 5 XIa, Art. 17 XIa, Art. 46 Xc, Art. 59 IVb of the Proposal for a Regulation on Markets in Crypto Securities 2020/0265 (COD), as amended following adoption by the Permanent Representatives Committee, 13198/22 of 5 October 2022.

2. Ecological distance selling and circular economy

Although digitization is often equated with newer technologies such as Big Data, AI, and platform concepts, one of the much older causes is e-commerce, which has been widely used since the early days of the internet.⁹⁵ Buying goods through the mail offers a convenient, although resource-intensive, consumption option not only in terms of shipping costs, but also in terms of dealing with returned goods, which are often destroyed for cost reasons despite potential reuse.⁹⁶ Far from being a purely economic phenomenon, distance selling via e-commerce is explicitly encouraged by EU regulations. This was done historically to promote consumer confidence in new sales channels, though consumer withdrawal rights implemented for this purpose under sections 312 et seq. of the German Civil Code are likely to change in the future as they have likely outlived their usefulness considering the ecological cost of transport and destruction of returns.⁹⁷ The remarkable potential of the EU Sales Law Directive to promote sustainability has not been exploited in the course of its recently-completed reform, which focuses on digitalization issues.⁹⁸ However, as part of its recent initiative to promote sustainable consumption of goods and encourage repair and recycling, the European Commission is planning to update the Sales Law Directive again and to introduce a separate piece of legislation that includes a right to repair.⁹⁹ These plans are closely related to the Commission's Action Plan for the Circular Economy¹⁰⁰ and are ultimately intended to engage consumers in environmental change. Sustainable consumption will be made easier for them with the help of digital product passports, among other things, the legal basis of which will be created with a newly introduced Eco-design Regulation.¹⁰¹ A right to repair, on the other hand, places special demands on market participants as soon as the repair affects data access rights, as in the case of smart devices on the Internet of Things through which sustainability issues also touch on a core concern of the European Data Act.¹⁰²

⁹⁵ See *Timmers*, Focus Theme 9 – 2 (1998), 3 (9 f.).

⁹⁶ See EHI Versand- und Retourenmanagement im E-Commerce 2021.

⁹⁷ Critically on this already *Grundmann*, JZ 2013, 56 f.

⁹⁸ Directive (EU) 2019/771 of the European Parliament and of the Council of 20 May 2019 on certain aspects of the sale of goods under contract, amending Regulation (EU) 2017/2394 and Directive 2009/22/EC and repealing Directive 1999/44/EC, ABl. L, Nr. 136, 22.5.2019, 28–50, available at: <[https://eur-lex.europa.eu/legal-content/de/ALL/?uri=CELEX%3A32019L0771#:~:text=Richtlinie%20\(EU\)%202019%2F771,von%20Bedeutung%20f%C3%BCr%20den%20EWR.](https://eur-lex.europa.eu/legal-content/de/ALL/?uri=CELEX%3A32019L0771#:~:text=Richtlinie%20(EU)%202019%2F771,von%20Bedeutung%20f%C3%BCr%20den%20EWR.)> (last accessed 15.2.2024); critical of the update for sustainability: *Van Gool/Michel*, EuCML 2021, 136.

⁹⁹ Proposal for a Directive of the European Parliament and of the Council on common rules promoting the repair of goods and amending Regulation (EU) 2017/2394, Directives (EU) 2019/771 and (EU) 2020/1828, COM(2023) 155 final of 22.3.2023.

¹⁰⁰ Communication from the Commission: A new Action Plan for the Circular Economy – Towards a Clean and Competitive Europe, COM(2020)98 final, of 11.3.2020, available at: <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A98%3AFIN>> (last accessed 15.2.2024).

¹⁰¹ For further details, see 2. a) below.

¹⁰² Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), ABl. L, 2023/2854, 22.12.2023, available at: <<https://eur-lex.europa.eu/eli/reg/2023/2854>> (last accessed 15.2.2024); on the problem *Mehnert* ZRP 2023, 9 (11).

3. Service platforms and labor law

The triumph of digital trading platforms has led to significant upheavals in economic life. Accordingly, the social aspect of sustainability must also be considered. Working conditions in call centers and logistics centers have often been criticized, and thus the sustainability discussion brings up core issues of labor law.¹⁰³

However, new questions are also raised. Services are offered via service platforms without an employment relationship being established with the platform directly; rather, the platform merely acts as an intermediary. In addition to high-quality consulting and design services, like the classic Uber rides and cleaning services, precarious services are also offered that are designed as click, crowd, or gig work.¹⁰⁴ This raises the question of fake self-employment of the service providers – which was answered in the UK, for example, by classifying Uber as the employer of the arranged drivers.¹⁰⁵ European legislators are planning a uniform market-wide checklist for the employee status of people working via digital platforms.¹⁰⁶

The German parliamentary group Bündnis 90/Die Grünen recently called for a bill to clarify the status of employees who work via intermediary platforms and to provide social security for gig, click, and crowd workers. In addition to being classified as employee-like individuals, a definition which includes occupational health and safety standards, such workers will also be effectively provided with the means of collective labor law under the German Works Constitution Act (*Betriebsverfassungsgesetz*).¹⁰⁷

It also seems advisable to pay attention to the ownership structures of these platforms and to promote a cooperative constitution. This can be done by strengthening the cooperative as a legal form by streamlining and modernizing the auditing associations. In this way, an alternative regulatory concept for digital trading platforms could be developed.¹⁰⁸

II. Enabling effect of digitization

1. Digital proof of origin

Sustainability is a strongly value-oriented concept that raises the question of the actual implementation of values and their traceability in private exchange relationships. Thus, the question of the authenticity of information about social and ecological production conditions arises not just for consumers, investors, but also for the public sector.¹⁰⁹ Trust and information problems could be solved by certifications based on neutral expertise, but complete documentation of the circumstances influencing sustainability characteristics could

¹⁰³ *Schubert*, NZA Beil. 2022, 5 (10 ff.); *Werth*, DZV of 14.07.2021, Mit IT zu nachhaltiger Logistik; *Waas*, ZRP 2022, 105 ff.

¹⁰⁴ For example, *Lingemann/Otte*, NZA 2015, 1042; *Krause*, NZA supplement 2017, 53; *Schubert*, RdA 2018, 200.

¹⁰⁵ On this point, see *Kocher*, ZEuP 2021, 606; for Germany, see *BAG JZ* 2021, 512 with comment *Junker*, JZ 2021, 519.

¹⁰⁶ Proposal for a Directive of the European Parliament and of the Council on Improving Working Conditions in Platform Work, COM(2021) 762 final, 9.12.2021, <available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A762%3AFIN>> (last accessed 15.2.2024).

¹⁰⁷ Antrag v. 3.3.2021 der Fraktion Bündnis 90/Die Grünen, BT-Drs. 19/27212.

¹⁰⁸ *Denga*, ZGE 2020, 1.

¹⁰⁹ On the admissibility of requirements for sustainable certification in public procurement, see EuGH, ECJ C-368/10, Commission/Netherlands, ECJ C-368/10, ECLI:EU:C:2012:284.

also have an impact.¹¹⁰ For example, since 2004 eggs sold must be printed with an egg code that provides information on the husbandry methods used.¹¹¹ However, physical labelling like this is not possible for proof of the ecological production of electricity. Here, digital certificates can help protect against counterfeiting, e.g. by storing them in a blockchain network.¹¹² Non-fungible Tokens (NFT) could then be issued in parallel to the realization of a sustainability factor – for example, the compensation of CO₂ emissions by planting a tree.¹¹³ Here, of course, it would be important that a trustworthy person oversees the interface between analog facts and digital certification (so-called *oracle*). If the trustworthiness of the certificate issuer is guaranteed, the NFT provides a secure proof of origin that can also be integrated into digital accounting systems and enables tradability.

The majority of committed companies also rely on digital solutions when implementing risk management based on supply chain law; a survey-based study by the German Association of Materials Management, Purchasing and Logistics (BME) shows that in the fall of 2022, 75 percent of the companies surveyed were already using technology to identify sustainability risks in their supply chains, compared to only 37 percent in the previous year.¹¹⁴ Providers such as IntegrityNext GmbH, which was involved in the study, are increasingly responding to this development. As a cloud-based platform, IntegrityNext can check a large number of suppliers for the consideration of sustainability aspects in a standardized and automated manner.¹¹⁵

With a view to sustainable consumption, the EU Commission will rely in future on binary consumer information in the form of a digital product passport in the Eco-design Regulation, which is to apply to almost all physical goods.¹¹⁶ In addition to a more efficient flow of information between companies and consumers, and also within the supply chain and its relationship with authorities, the Commission hopes to provide advantages in the monitoring and enforcement of sustainability-related regulations.¹¹⁷ The product passport will be easily accessible: a QR code will be assigned to the respective product and then stored and maintained in a decentralized manner for the benefit of flexibility and innovation. The Commission also plans to establish a product passport register to aid in enforcement.¹¹⁸

¹¹⁰ Cf. in detail the contributions in *Burgi/Möslein* (eds.), *Zertifizierung nachhaltiger Kapitalgesellschaften*.

¹¹¹ Commission Regulation (EC) No 2295/2003 of 23 December 2003 introducing detailed rules for implementing Council Regulation (EEC) No 1907/90 on certain marketing standards for eggs, *Amtsbl. L* 340, 24.12.2003, 16–34, available at <[https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=CELEX %3A32003R2295](https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=CELEX%3A32003R2295)> (last accessed 15.2.2024); replaced by Commission Regulation (EC) No 589/2008 of 23 June 2008 introducing detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards the marketing standards for eggs, *ABl. L* 163, 24.6.2008, 6–23, available at: <<https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=celex%3A32008R0589>> (last accessed 15.2.2024).

¹¹² See EnBW's project description, available at: <<https://www.enbw.com/unternehmen/eco-journal/herkunnachweis-per-blockchain.html>> (last accessed 15.2.2024).

¹¹³ On this, *Vöβ*, *BKR* 2022, 620 (621); on NFTs *Denga*, *BKR* 2022, 288 f., *Henke*, *JZ* 2022, 222.

¹¹⁴ Joint study by BME and IntegrityNext, *Transparent, Sustainable Supply Chains, 2023*, available at: <<https://insights.integritynext.com/bme-umfrage-2021>> (last accessed 15.2.2024), 4.

¹¹⁵ <<https://www.integritynext.com/de/plfootatform>> (last accessed 15.2.2024).

¹¹⁶ Proposal for a Regulation of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for sustainable products and repealing Directive 2009/125/EC, COM(2022) 142 final/2, 30.3.2022, available at: <<https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A52022PC0142>> (last accessed 15.2.2024).

¹¹⁷ COM(2022) 142 final/2, see fn. 116, 11 f.

¹¹⁸ COM(2022) 142 final/2, see fn. 116, recitals 32, 34.

2. Resource Management through Big Data and Distributed Ledger Technology (DLT)

In times of resource scarcity, resource management is essential not just for every company, but for society as a whole, especially regarding the energy transition.¹¹⁹ For efficient allocation, it is important to control consumption. There is no other way to meet the major challenges of the energy transition and energy self-sufficiency. In this context, great hopes are being placed in blockchain technology in particular.¹²⁰ In fact, in practice, there are already energy trading platforms on which it is possible to track energy sources precisely.¹²¹ In the UK, a consortium of key players in the energy infrastructure market has launched a corresponding pilot project for a DLT registry.¹²² The central concern is to create transparency, which is entirely in line with the non-financial reporting requirements. Under the CSRD, even more information on sustainability issues must now be disclosed.¹²³ Here, reliable registers that provide a complete picture of energy consumption can serve as a reference and be included in the report pursuant to Section 289c (1) No. 1 HGB. This fulfils the requirement for careful selection and evaluation of reporting sources.¹²⁴ However, it is then important to carefully implement and review the DLT registers.

The sheer mass of data on social and environmental factors in the company can be managed with complex algorithms – „Big Data“ – if required.¹²⁵ However, caution is still required here regarding exaggerated expectations of the technology's performance as the quality of AI applications depends to a large extent on training and the machine-readable data sets used for this purpose. Finally, the programming of sustainability aspects into algorithmic decision-making bases must also be considered.¹²⁶

3. Democratic participation through digital management

Digital means enable innovations in the internal governance of companies that can also promote democratic participation as part of social sustainability. In the case of the GmbH, for example, Section 45 (2) of the German Limited Liability Companies Act (GmbHG) provides for extensive freedom of design for the adaptation of decision-making processes, which enables the use of digital governance means.¹²⁷ This makes it easier for shareholders to participate in decision-making processes; by reducing the transaction costs for exercising voting rights, the use of the institution of voting immediately becomes more accessible and thus more likely to be used.

In addition to „online“ meetings (cf. only Section 46 (1) sentence 2 GmbHG; Section 118a AktG; Section 43b GenG), blockchain-based governance tokens are also suitable for

¹¹⁹ *Held/Diefenbacher/Zieschank/Gözet/Gran*, Internationale Verteilungseffekte von Ressourceneffizienz, 50; see also Eckardt/Rath NVwZ 2022, 1665 (1671); *Z. Bamberger*, in: *Bergmann*, Handlexikon der Europäischen Union; Action Plan: Financing Sustainable Growth, COM(2018) 97 final, 8.3.2018, available at: <<https://eur-lex.europa.eu/legal-content/de/ALL/?uri=CELEX%3A52018DC0097>> (last accessed 15.2.2024).

¹²⁰ *Zerche*, Distributed Ledger as a Tool for a Decentralized Energy Transition.

¹²¹ See, for example, the self-description of <<https://www.powerledger.io/>> (last accessed 15.2.2024).

¹²² Documentation can be found at <https://smarter.energynetworks.org/projects/nia_ngso0018/> (last accessed 15.2.2024).

¹²³ Cf. fn.46; on this, e.g. *Loitz*, DB 2022, 2809, 2873.

¹²⁴ For further details on the standards, see *Kajüter*, in: MünchKommHGB, §§ 289b–289e Rn. 40 et seq.

¹²⁵ On the realization of environmental protection through AI, e.g. *Martini/Ruscheimer* ZUR 2021, 515.

¹²⁶ *Martini/Ruscheimer*, ZUR 2021, 515.

¹²⁷ On this point, see *Maume*, 2021, 1189 (1193).

streamlining and facilitating decision-making processes. Governance tokens enable their holders to identify themselves as shareholders with voting rights; if they are used, asynchronous voting on decision proposals is possible, which can be evaluated electronically. DAOs in particular are embracing this technology,¹²⁸ which is by no means reserved for the crypto scene but can be of interest to any company with a broad shareholder base as a democratic alternative to voting trustees and representatives.¹²⁹

Finally, democratic participation is also enhanced by digital logging or authorization of transactions. Digital means of control can help solve the principal-agent problem that is structurally present in every society¹³⁰ by reducing the uncontrolled spaces and opportunities for managers. Although smart contracts are not a panacea due to their limitation to digital facts,¹³¹ they can, for example, support transparency in the use of financial resources.

D. Digitization and sustainability as a dual task for management

The tableau of interrelationships between digitization and sustainability could be extended considerably - only core aspects can be mentioned here. For the management of companies, both the importance and the interactions of the two guiding themes can no longer be denied. In pursuing their respective digitization strategies, company management must consider the requirements of sustainability; and in fulfilling their sustainability obligations, they must in turn consider the means of digitization. Sustainability and digitization strategies are thus closely intertwined and ultimately radiate throughout the corporate organization.¹³² When it comes to fulfilling company-related due diligence obligations, the question naturally arises as to the *practical* implications of these abstract guiding principles.

While CSR (and also „ESG“), as shown, is increasingly developing into a „hard“ legal obligation with direct reference to the concept of sustainability, the obligation to observe and implement digitization aspects can currently only be determined indirectly in some cases. However, a management obligation to avert and prevent IT risks for the company can be derived from Section 1 of the German Act on the Stabilisation and Restructuring Framework for Businesses (StaRUG), as these can undoubtedly endanger the „existence of the legal entity“.¹³³

In addition, special compliance obligations arise from European regulations that are becoming increasingly dense, particularly in the digital area, through both industry-specific regulations and regulations with horizontal effect. For example, when it comes to online

¹²⁸ Critical regarding lack of transparency and possibly strong concentration in the distribution of governance tokens *Möslein/Kaulartz/Rennig*, RDi 2021, 517 (520).

¹²⁹ On the exercise of voting rights by intermediaries, see in particular Sec. 135 AktG; on voting trustees *Armbrüster*, Die treuhänderische Beteiligung an Gesellschaften.

¹³⁰ Fundamental *Jensen/Meckling*, Journal of Financial Economics 1976, 305; *Fama/Jensen*, Journal of Law and Economics 26 (1983), 301; esp. on monitoring mechanisms *Alchian/Demsetz*, The American Economic Review 62 (1972), 777 (782); on opportunity risks *Picot/Dietl/Franck/Fiedler/Royer*, Organisation, 89 ff.

¹³¹ On intelligent contracts *Paulus/Matzke*, ZfPW 2018, 431; *Möslein*, ZHR 183 (2019), 254.

¹³² In general, *Spindler*, Unternehmensorganisationspflichten, 2011.

¹³³ For example, the loss of data as a result of a power failure at a kitchen manufacturer led to insolvency, <<https://www.westfalen-blatt.de/owl/kreis-herford/roedinghausen/stromausfall-rational-kuechen-voraus-2669322?pid=true>> (last accessed 15.2.2024); in general on IT-related duties of care of the management, also *v. Holleben/Menz*, CR 2010, 63; *Krupna*, BB 2014, 2250; *Spindler*, CR 2017, 715.

platforms, the GDPR, which affects every company¹³⁴, combines with the new „Magna Charta“ of the digital space, the Digital Services Act.¹³⁵ What these two laws have in common is that they oblige companies to monitor an abstract risk situation and ward off threats. Sustainability in its social and environmental dimension must act here as a boundary and guardrail for digital compliance, as explained above.

§ Section 1 StaRUG, which makes the continued existence of the legal entity the subject of management duties (without any time limit), is also applicable to environmental concerns, so that a strong environmental duty of care on the part of management already seems plausible *de lege lata*. It is admittedly relativized by a cost-benefit calculation and limited by aspects of social appropriateness.¹³⁶ Final doubts, however, are dispelled by recent EU legislative activities, which provide for a strong sustainability duty of management with personal liability.¹³⁷ The key question here is: how concrete do the risks have to be for management to act? Does climate neutrality have to be achieved immediately, or is a phased program with a relatively generous grace period for the current conditions sufficient – as presented by the German government in the unconstitutional Climate Protection Act?¹³⁸ Does the principle of intergenerational justice also apply to the economy? A synchronization of responsibility concepts seems conclusive, yet conversely, there are no arguments for putting future stakeholders and shareholders at a disadvantage compared to those of today. If one affirms a serious obligation for the company to create sustainable value, this also means that all available means must be exhausted (in appropriate proportion) and demanded from business partners. This obliges the use of digital means if they promise more effectiveness than analog means.

Finally, in addition to CSR, which is now increasingly being legalized, awareness of corporate digital responsibility (CDR) has also recently developed on the part of corporate management.¹³⁹ There is enormous potential for development and synergy here in the future: like CSR, CDR is largely based on voluntarism in its current early stages, but its legalization is also only a matter of time. In its CDR initiative launched in 2018, the German federal Ministry of Justice defines CDR as „voluntary entrepreneurial activities that [...] go beyond what is prescribed by law and actively shape the digital world for the benefit of society.“¹⁴⁰ It is thus a concept of comprehensive corporate responsibility that combines sustainability and digitization aspects in the interest of a successful digital transformation.¹⁴¹ The enormous transformational effect that a combination of CSR and CDR will have on corporate management in the coming years already requires an intensive examina-

¹³⁴ On the organization-related compliance requirements under Art. 25 GDPR, see *Mantz*, in: Sydow/Marsch, DS-GVO / BDSG, Art. 25 para. 60; more generally, the contributions in Bittner/Guntermann/Müller/Rostam, Cybersecurity als Unternehmensleitungsaufgabe.

¹³⁵ For an overview, see *Denga*, The „Digital Services Act,“ in *Ruffert/Kühling* (eds.), Platform Regulation. Schriften der Wissenschaftlichen Vereinigung für das gesamte Regulierungsrecht 2023, in preparation.

¹³⁶ Cf. *Mock*, in: BeckOKStaRUG, § 1 No. 30 ff.

¹³⁷ See above, I.4.

¹³⁸ For more information, see the references given in footnote 72.

¹³⁹ *Dürr*, ZGE 2021, 165; *Herden et al.* NachhaltigkeitsManagementForum 29 (2021), 13; *Möslein*, in: Kumpan/Roth, Festschrift für Hopt, 805; see also *Hoffmann-Riem*, Recht im Sog der digitalen Transformation, 2022, 79 ff., 124.

¹⁴⁰ *BMUV*, Code of Digital Corporate Responsibility, 2020, 2.

¹⁴¹ This is also the view of the German Digital Industry Association, Corporate Digital Responsibility, <<https://www.bvdw.org/der-bvdw/gremien/corporate-digital-responsibility/cdr-building-bloxx/>> (last accessed 15.2.2024).

tion of the convergences and interactions of the guiding discourses of sustainability and digitization.

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