Technology neutral EU law: digital goods within the traditional goods/services distinction

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ABSTRACT

The article responds to a growing number of demands by governmental and non-governmental organisations that call upon the EU institutions to level the legal treatment of digital and physical goods. The article stems from the established criteria for distinguishing between goods and services in the marketing domain, and analyses on the importance attributed to the tangibility and tradability of products from the Court of Justice of the European Union’s case law. On this basis, consequences of treating digital goods as analogous to physical goods are considered in certain legal fields, where it has recently been demonstrated that the categorization of digital goods is of paramount legal importance, most notably in the field of copyright, taxation, and consumer protection law.

KEYWORDS: EU law, Digital Single Market, digital goods, digital content, internal market, copyright, exhaustion, taxation, consumers

INTRODUCTION

The European Commission has defined the completion of the Digital Single Market as one of its 10 political priorities.1 A Digital Single Market is, according to the 2015 Commission’s Communication, one in which the free movement of persons, services and capital is ensured and where the individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence.2 This should ensure that Europe maintains its position as ‘a world leader in the digital economy, helping European companies to grow globally’. A well-functioning Digital Single Market should make online access to goods and services easier and, therefore boost the traditional free movement of goods and services. It will also increase the digital skills and learning of European citizens so they can use

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digital transactions to their personal benefit—as consumers, patients and public administration clients.

At the centre of the Digital Single Market are digital goods, a broad and rapidly expanding term in view of the variety of ‘goods’ actually covered, referring to all goods that are stored, delivered and used in its electronic format, such as smartphone applications, digital music and books, computer design files for 3D printed products, for instance houses, medical devices and food. As such digital goods may be distinguished from physical (or analogue) goods that refer to material things with physical dimensions, but also from services that were traditionally considered as something that cannot be stored nor owned. Therefore, digital goods bring a broad range of legal challenges in respect of whether they should legally be treated as physical goods or as services—or, alternatively, as a sui generis concept and what consequences this would bring—inter alia in the field of copyright, taxation and consumer protection law.

This article responds to a growing number of demands by governmental and non-governmental organizations that call upon the EU institutions to level the legal treatment of digital and physical goods. This stems from the established criteria for distinguishing between goods and services in the marketing domain, and analyses on the importance attributed to the tangibility and tradability of products from the Court of Justice of the European Union’s (hereinafter EU Court) case law. On this basis, consequences of treating digital goods as analogous to physical goods are considered in certain legal fields, where it has recently been demonstrated that the categorization of digital goods is of paramount legal importance, most notably in the field of copyright, taxation, and consumer protection law. Consequently, certain conclusions are made on the justifiability of the aforementioned calls for the legal unification of digital and physical goods.

DIGITAL GOODS WITHIN GOODS/SERVICES DISTINCTION
Distinguishing goods and services in marketing
Although the distinction between goods and services at first sight may seem straightforward, explicit definitions of the terms have troubled scholars from different domains since the 18th century. Smith stated that goods have an exchangeable value and one of the main characteristics of a good is that its ownership rights can be established and exchanged. Senior described goods as material things, meaning that goods are tangible and have physical dimensions. Furthermore, Parry et al. define goods as having the following attributes: they are physical objects for which a demand exists, their physical attributes are preserved over time, ownership rights can be established, they exist independently of their owner, they are exchangeable and they can be traded on markets.

3 cf German Civil Code, BGB (in the version promulgated on 2 January 2002, Bundesgesetzblatt, I page 42, 2909), s 90, under which only corporeal objects are things as defined by law.
While the aforementioned characteristics of goods are relatively commonly accepted, there has been less agreement about the definition of services. As explained by Moeller, four characteristics have been regularly applied to denote what constitutes a service: intangibility, heterogeneity, inseparability and perishability (so-called IHIP characteristics). Nonetheless, the characteristics attributed to this definition have attracted substantial criticism. For example, intangibility means that services are not physical objects and only exist in connection to other things. In this sense, Harker humorously described services as 'something that you cannot drop on your foot'. Although the intangible nature of services is a useful characteristic to employ, it has failings as a differentiator between services and goods. As Hill notes, books and films are all intangible goods that are marketed in such a manner that they can be physically stored. A story generated by its author, music created by composers or software games have no physical dimensions, but, since they are stored on media such as paper, film or disk, they have material characteristics of goods and, thus, have little in common with services. Additionally, tradability is one of the most decisive, but still not generally applicable distinguishing criteria between goods and services. As Rathmell points out, goods can be owned and the ownership can be transferred. Services, on the other hand, refer to an act, which is paid for by the buyer but without establishing an ownership right. Services, therefore, cannot be traded. Nevertheless, due to the rapid development of technology, services can now be provided in a way similar to goods, including being produced in one state and exported to another, which may have hardly seemed possible to Adam Smith. This is also reflected under property law, where personal property describes all things, which are subject to individual rights, whether they are tangible or intangible. Under property law it thus seems more important to distinguish between real and personal property than between tangible and intangible property.

Goods and services thus have many distinguishing features, but also many similarities. It is hence more appropriate to talk about a full spectrum of forms of digital goods—from pure goods on one side to pure services on the other. More recently, marketing researchers shifted their thinking from a pure service or pure product focus to a combination of product-service system (PSS), where offering a combination of products and services generates greater income. Moreover, in this respect,

11 The very title of the fundamental WTO Treaty—The General Agreement on Trade in Services (GATS)—evidently proves this development.
the term ‘servitization’ was coined to describe the process whereby companies increase revenue by offering service options in addition to their products.15 Vandermerwe and Rada who have coined the term ‘servitization’ claim that it is no longer valid ‘to draw simplistic distinctions between goods and services’ and that it is necessary to move from ‘the old and outdated focus on goods or services to integrated “bundles” or systems . . . with services in the lead role’.16 It is believed that ‘an industrial renaissance’ or ‘reindustrialisation’ enabled by servitization can bring jobs and growth back to Europe.17 EU Commissioner Elżbieta Bieńkowska has hence claimed that ‘manufacturing and services are two sides of the same coin’ and that ‘in the modern economy, you cannot choose the one or the other . . . You must do both’.18 Notwithstanding all this, however, various forms of business models that come under the servitization ‘umbrella’ open challenges of their legal categorization and treatment of transactions where goods and services’ dimensions are increasingly blurred—particularly due to the digital dimension of an increasing number of physical goods (in particular in respect of the Internet of Things).19

Goods/services distinction under EU Law

Despite the calls for a uniformed approach towards the sale of goods and services from scholars working in the domains of marketing and manufacturing, legislators and courts are usually more conventional, protecting the traditional distinction between goods and services. This holds true for both national and EU law. Consequently, the UK Sale of Goods Act (SGA)20 contains a (partial) definition of goods (ie personal chattels), while there is no corresponding general definition of services.21 Moreover, under the Supply of Goods and Services Act 1982 (SGSA) the consumer enjoyed a significantly lower level of protection in relation to services provided under contract

16 Vandermerwe and Rada, ibid 314.
18 Bieńkowska, ibid.
19 Debasis Bandyopadhyay and Jaydip Sen, ‘Internet of Things: Applications and Challenges in Technology and Standardization’ (2011) 58 Wireless Personal Communications 49; Fawzi Behmann and Kwok Wu, Collaborative Internet of Things (C-IoT): For Future Smart Connected Life and Business (John Wiley & Sons 2015); Michael Miller, The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World (Que 2015).
20 Sale of Goods Act 1979, c 54. The Act was replaced for consumer contracts from 1 October 2015 by the Consumer Rights Act 2015.
than he or she did in relation to goods. Finally, the Consumer Protection Act that partially replaced the SGA and the SGSA as of 2015 for all consumer contracts includes a definition of goods—but it does not provide one for services.

At EU level, the calls for legal unification of the concepts of goods and services began in 1980 with Hunnings’ comment on the *Debauve* and *Coditel* cases, in which he compared sending the Financial Times newspaper from London to Frankfurt by post and by fax. He claimed that the means of transportation should not have made a considerable difference in the legal consequences and was critical about old-fashioned thinking of lawyers when dealing with new technologies:

'We are faced in reality with two different forms of transportation . . . . The end result is exactly the same: the physical object in London has been transported into the hands of the recipient in Frankfurt. The conceptual blockage which prevents this equivalence being acted upon is the lawyer’s reluctance to move from Newtonian physics to quantum physics, an inability to attribute physical characteristics to anything that cannot be held in the hand and thus an unwillingness to accept that one can “import” electronic signals. This reluctance is likely to have more serious consequences than that of cable television.'

Nevertheless, Hunnings’ call for unification was not responded to for many years following his comments. The EU Court, which was tasked to define the distinction between goods and services within EU internal market law, approached this assignment by considering established distinguishing factors from other domains as well as from specific EU law objectives. As highlighted by Snell, the differentiating characteristic for the EU Court has been that goods are material objects, whereas services are not. Goods were, consequently, defined as ‘products which can be valued in money and which are capable, as such, of forming the subject of commercial

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22 ibid 27.
23 Consumer Rights Act 2015 c 15.
24 Goods are defined as ‘any tangible moveable items, but that includes water, gas and electricity if and only if they are put up for supply in a limited volume or set quantity’ – ibid, s 2(8).
25 Case S2/79, Procureur du Roi v Marc JVC Debauve and others, ECLI:EU:C:1980:83 concerned national rules prohibiting the transmission by cable television of advertisements. These rules were considered consistent (non-distinctly applicable as well as proportional) with art 56 TFEU (at that time art 59 EC) by the Court.
26 Case 262/81, Coditel SA, Compagnie générale pour la diffusion de la télévision, and others v Ciné-Vog Films SA and others, ECLI:EU:C:1982:334. The case concerned a contract whereby the owner of the copyright in a film had granted an exclusive right to exhibit that film for a specific period in the territory of a Member State. The Court ruled that such a contract is not subject to the prohibitions contained in art 101 TFEU (at that time art 85 EC).
28 It has eg ruled that marijuana does not constitute goods under EU law – Case C137/09, Marc Michel Josemans v Burgemeester van Maastricht, ECLI:EU:C:2010:774. The most thorough analysis of the goods/services distinction under EU law was made by Jukka Snell, *Goods and Services in EC Law: A Study of the Relationship Between the Freedoms* (OUP 2002).
29 ibid 4.
transactions’30 and as ‘objects which are shipped across a frontier’.31 Services, on the other hand, are of non-material character. Thus, the transmission of television signals falls within the Treaty rules relating to services while things such as films are considered goods.32

Notwithstanding this, however, tangibility has not consistently been the essential feature that distinguishes goods from services under EU law. The EU Court had no reservations with the determination that electricity falls under the ambit of goods,33 despite hearing several arguments of the Italian government that the EU Court did not sufficiently take into account the technical characteristics, especially its intangibility and the fact that it cannot be stored. In Jägerskiöld,34 Advocate General Fennelly pointed out, that it is rather extraordinary that the EU Court considered electricity a good. He added that, in his opinion, it should be regarded as a specific example of power, taking into account its function as an energy source making it a competing product with gas and oil.35 Snell, however, explains the approach of the EU Court with its desire to put electricity, oil and gas under the same provisions.36 This clarifies why the EU Court nevertheless excluded certain other types of intangible assets from the concept of goods. In Jägerskiöld, it was asked, whether fishing rights and licences constitute goods. Advocate General Fennelly felt that the classic definition of this concept from the case Commission v Italy (Art) does not cover ‘everything that has a value, and thus can be traded’, and that the goods, in the general sense of the word, have tangible physical properties. On this basis, he concluded that fishing rights and licences do not constitute goods, but services instead—similar to the hiring out of sporting facilities, hotel accommodations, or of other rights related to the temporary enjoyment of immovable property.37 The EU Court supported his opinion. The question that follows then is, whether digital goods are closer to the sales of goods or to the hiring out of sporting facilities.

Are digital goods actually goods or services?

A common, non-legal definition describes the term digital goods as a ‘general term that is used to describe any goods that are stored, delivered and used in its electronic format. Digital goods are shipped electronically to the consumer through e-mail or download from the Internet’.38 The 2011 EU Consumer Rights

30 Case 7/68, Commission v Italy (Art), ECLI:EU:C:1968:46.
31 Case C-2/90, Commission v Belgium (Wallonian waste), ECLI:EU:C:1992:310.
33 Case 6/64, Flaminio Costa v ENEL, ECLI:EU:C:1964:66; Case C-393/92, Commune d’Almelo and others v NV Energiebedrijf Isselmi, ECLI:EU:C:1994:171; Case C-158/94, Commission v Italy, ECLI:EU:C:1997:500, paras 14–20. Electricity is normally considered as goods also under the national sale of goods and consumer protection legislation as well as under national criminal codes, which is decisive for definition of a theft.
34 Case C-97/98, Jägerskiöld, ECLI:EU:C:1999:515, opinion of Advocate General Fennelly, para 20.
36 Snell (n 28) 4.
37 Case C-97/98, Jägerskiöld, (n 35) paras 21–23.
Directive\(^{39}\) uses the term ‘digital content’, which is defined as ‘data which are produced and supplied in digital form’.\(^{40}\) Its preamble provides the following examples: ‘Digital content means data which are produced and supplied in digital form, such as computer programs, applications, games, music, videos or texts, irrespective of whether they are accessed through downloading or streaming, from a tangible medium or through any other means’.\(^{41}\)

In line with this, commentators normally draw a distinction between digital products supplied in physical form and those supplied entirely digitally, eg by Internet download. Situations may vary to a great extent: the online purchase of a book is a digital transaction, which does not involve the supply of a digital product; on the other hand, the download of the book to be read as an e-book involves digitally contracting for the digital delivery of a digital product. Again, the online purchase of a CD, involves digitally contracting for the physical delivery of a product, which may be regarded as digital or physical, whereas one may also purchase software in a local computer store.\(^{42}\) Finally, we are currently witnessing the development of ‘cloud computing’ which, rather than supplying the consumer with a copy of the program, involves the software supplier allowing the consumer to access the program supplier’s server via the Internet to obtain the product.\(^{43}\) Thus, this new process more closely resembles the supply of a service than a contract for the supply of goods.\(^{44}\)

This broad spectrum of forms in which digital goods exist is also reflected in the EU Court’s case law. In general, if digital goods are not related to a tangible entity, rules on services will apply; if they do, rules concerning goods will apply. In Sacchi, the EU Court held that, ‘the transmission of television signals, including those in the nature of advertisements, comes, as such, within the rules of the Treaty relating to services’.\(^{45}\) The next paragraph of the judgment deals with trade in materials (tapes, film etc.) used for television programmes, which are covered by the rules relating to the

40 Art 2(11) of the Directive 2011/83/EU. cf UK Consumer Protection Act 2015 that defines ‘digital content’ as data which are produced and supplied in digital form – s 2(9) as well as German Civil Code (BGB) 200, under which digital content is defined as not being contained in a tangible medium and that is produced and made available in digital form – s 90.
41 Recital 19 of the preamble to the Directive 2011/83/EU.
42 Robert Bradgate, ‘Consumer Rights in Digital Products’ (A research report prepared for the UK Department for Business, Innovation and Skills 2010) 12. The examples above also clearly show the difference between e-commerce and digital goods.
44 Bradgate (n 21) 14.
45 Case 155/73, Giuseppe Sacchi, ECLI:EU:C:1974:40.
movement of goods. This ruling is still good law as evidenced by the EU Court’s more recent decision in *Dynamic Medien*46 where Germany prohibited sale of DVDs or video cassettes with cartoons without an age-limit label corresponding to a classification from a higher regional authority. The EU Court considered the case under the free movement of goods rules,47 finding the national rules to be measures having equivalent effect to quantitative restrictions that are prohibited by Article 34 Treaty on Functioning of the European Union (TFEU).48

In contrast to this, however, in *Football Association Premier League (‘the FAPL’)*49 the EU Court treated prohibition of the importation of foreign decoding devices under free movement of services rules—considering that the decoding devices merely provide access to the signal, which enables the broadcasting services. The EU Court held that national legislation, which prohibited the import, sale or use of foreign decoder cards, was contrary to the freedom to provide services.50 It explained that ‘the national legislation is not directed at decoding devices, but deals with them only as an instrument enabling subscribers to obtain the encrypted broadcasting services’.51 Rules on the free movement of goods were, thus, not applied.52

On the other hand, however, the *UsedSoft*53 case was decided using principle of exhaustion that has until then been applied only to physical goods although it referred solely to the downloading and storing of software on customers’ computers. In Usedsoft the EU Court recognized ownership rights (traditionally only attributable to physical goods) in relation to software and accordingly extended the principle

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46 Case C-244/06, *Dynamic Medien Vertriebs GmbH v Avides Media AG*, ECLI:EU:C:2008:85.
48 Already the case in *Henn and Darby* (Case 34/79, ECLI:EU:C:1979:295), in which the United Kingdom Government banned the importation of pornographic materials, was decided on the basis of free movement of goods rules. See also English case of *International Computers Ltd v St Albans District Council* [1996] 4 All ER 481, where it was decided that software supplied on some physical medium will be regarded as a sale of goods. In contrast, the situation where software is supplied by downloading it from the Internet, or uploading it from a CD, which is retained by the supplier and not supplied to the customer, is not considered as sale of goods by English courts, because nothing tangible is supplied. Nevertheless, a sale of goods is involved when one purchases a new personal computer that comes bundled with a number of software programs—as illustrated in Australian case *Toby Constructions Products Pty Ltd v Computa Bar (Sales) Pty Ltd* [1983] 2 NSWLR 48.
49 Joined Cases C-403/08 and C-428/08, *Football Association Premier League v QC Leisure and Others* and *Karen Murphy v Media Protection Services Ltd*, ECLI:EU:C:2011:631.
51 Joined Cases C-403/08 and C-428/08, para 82.
52 This is in line with the EU Court’s ruling in case C-20/03, Marcel Burmanjer, ECLI:EU:C:2005:307, where the EU Court stated that an economic activity should be examined in the context of either the free movement of goods or the freedom to provide services if one of these elements ‘is entirely secondary in relation to the other and may be considered together with it’—see paras 34–35). cf case C108/09 Ker-Optika bt, ECLI:EU:C:2010:725, para 43 and case C-275/92, Schindler, ECLI:EU:C:1994:119.
of exhaustion developed under free movement of goods rules to software. This conclusion was based on the EU Court’s establishment of an EU wide definition of the term sale: ‘an agreement by which a person, in return for payment, transfers to another person his rights of ownership on an item or tangible or intangible property belonging to him’.54 Furthermore, the EU Court made numerous arguments about the principles of equivalence between digital and physical goods.55 In particular, it ruled that it made no difference whether the copy of the computer program was made available to the customer by means of a download or a physical CD or DVD56 and that the online transmission method was the ‘functional equivalent’ to the supply of a material medium.57 This is in line with the practice of the World Intellectual Property Organisation (WIPO), that quite explicitly categorizes software as goods, whether it is delivered offline or online.58 Consequently, the ruling has been declared as ‘a fundamental decision on the interaction between intellectual property rights and the European single market in the online world’59 and compared to the importance of Consten and Grundig60 and Deutsche Grammophon61 in relation to physical goods in the 1960s and 1970s.62

Bradgate supports this categorization by stating that:

‘provision of a service involves doing something. Therefore making downloads available at a website involves the provision of a service; but the download itself is not a service within this definition; it has much more in common with a ‘thing’, albeit an intangible one, and therefore . . . a download is not in itself an activity but is closer to the concept of goods.’63

Furthermore, Dreier agreed that ‘it is of secondary importance whether the offering is conducted offline or online’.64 These arguments are also in line with the UN

54 ibid para 42.
56 Case C-128/11, UsedSoft, para. 47.
57 ibid para 61.
58 World Intellectual Property Organization (WIPO), International Classification of Goods and Services for the Purposes of the Registration of Marks, 10th edn, 2011 defines that goods inter alia include ‘all computer programs and software regardless of recording media or means of dissemination, that is, software recorded on magnetic media or downloaded from a remote computer network’—see Class 9, Explanatory Note. WIPO’s practice is applied by the EU Office for the Harmonisation in the Internal Market (OHIM), which administers the European trademark system.
60 Joined cases 56 and 58/64, Établissements Consten Sà.r.l. and Grundig-Verkaufs-GmbH v Commission, ECLI:EU:C:1966:41.
62 More in the Section ‘Exhaustion of copyright’ below.
63 Bradgate (n 21) para 159.
Convention on the International Sale of Goods (CISG), which *inter alia* applies to situations in which software is permanently transferred to the other party in all respects except for the copyright—as opposed to mere agreements on temporary use against payment of royalties.\(^{65}\) In this respect Diedrich clarifies that ‘any item that can be commercially sold and in which property can be passed on and which is not explicitly excluded from the CISG’s sphere of application by virtue of Art. 2 CISG can be the subject matter of a contract of sale, i.e. goods, pursuant to Art. 1(1) CISG’.\(^{66}\) Accordingly, the sale of computer software is covered by the CISG as the latter does not limit its sphere of application to tangible things. The mode, in which the software is delivered, i.e. via disc or electronically, is therefore irrelevant under CISG.\(^{67}\) As Diedrich puts it, this would be the same as excluding beer from the sphere of application of CISG if it is being sold in a bottle and from the tap.

In contrast to this, in the most recent cases of *Commission v Luxembourg and France*,\(^{68}\) the EU Court denied affording digital books the same Value Added Tax (VAT) status as afforded to the ‘supply of books on all physical means of support’ for which Member States may apply a reduced rate of VAT, despite the fact that digital books also need a physical apparatus (such as a computer) to be read. The Court pointed out that a reduced rate of VAT can apply only to supplies of goods and services covered by Annex III to the VAT Directive, which refers in particular to the ‘supply of books … on all physical means of support’. The Court established that the reduced rate of VAT is applicable to a transaction consisting of the supply of a book found on a physical medium. While the Court admitted that in order to be able to read an electronic book, physical support is required, such support is, according to the Court, not included in the supply of electronic books, meaning that Annex III does not include the supply of such books within its scope. Moreover, the Court found that the VAT Directive excluded any possibility of a reduced VAT rate being applied to ‘electronically supplied services’ and held that the supply of electronic books is such a service.\(^{69}\)

What can be established from the foregoing is that the EU Court is not taking a uniform approach towards digital goods, but rather treats them alternately as goods and services. It is understandable that when determining the legal categorization of digital goods the EU Court (as well as the Commission) do not only examine objective characteristics of digital goods, but also consider the broader result they want to achieve through their case law and proposals of EU legislation. In line with the Court’s elementary *modus operandi* one can conclude that when the Court was called

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\(^{67}\) Schlechtriem and Schwenzer (n 65) 35. This view is also supported by the case law—See eg *Silicon Biomedical Instruments BV v Erich Jaeger GmbH*, RB Arnhem, 28 June 2006, CISG-Online 1265, (<http://cisgw3.law.pace.edu/cases/060628n1.html>) accessed 27 August 2016. The case concerned a dispute between a Dutch buyer and a German seller of software used in hospitals. CISG was held to be applicable.


\(^{69}\) ibid, paras 25–29.
upon to interpret the principles of EU law (eg the principle of exhaustion that is supporting free movement of goods on the internal market and limiting copyright) it was open to broaden the definition of the term ‘goods’ so as to cover digital goods. In contrast, however, when the Court was called upon to interpret derogations to the principles of EU law it followed its established maxim of interpreting the derogations narrowly, thereby not allowing the broadening of the national autonomy in certain fields, which could lead to the partitioning of the internal market (such as a reduced rate of VAT), from physical goods to the digital ones. This varied approach of the EU Court towards classification of digital goods undeniably has several relevant legal consequences that are examined in the following chapter.

3. LEGAL CONSEQUENCES OF THE GOODS/SERVICES DISTINCTION FOR DIGITAL GOODS

In general, if a transaction is considered as a trading of goods, measures affecting cross-border trading will be covered by Article 34 TFEU, which has vertical direct effect only and therefore does not prohibit restrictive measures of private entities (at least not directly). Additionally, it is leaving the Member States with the autonomy to determine the precise marketing rules, ie when and how these goods may be sold as proclaimed by the EU Court in Keck. On the other hand, if a transaction falls under the rules on services, Article 56 TFEU binds not only the Member States, but also private entities and the famous Keck rule giving the Member States autonomy to regulate selling arrangements does not apply. Recently, however, it became


73 Case C-384/93, Alpine Investments v Minister van Financien, ECLI:EU:C:1995:126. For a comment see Mads Tennessen Andenæs and Wulf-Henning Roth, Services and Free Movement in EU Law (OUP 2002).
particularly relevant as to whether digital goods should be considered on equal footing with physical goods in specific fields, such as copyright, taxation, and consumer protection law. The following chapters briefly analyse legal consequences of (not) treating digital goods as physical goods in these three legal domains.

Exhaustion of copyright

One major issue of digital goods that is dependent upon its classification as goods or services concerns exhaustion of copyright under EU law.\textsuperscript{74} The principle of exhaustion provides that a copyright owner’s right to control copies of their work ‘exhausts’ on its first sale by the copyright owner or with their consent. The principle prevents the copyright owner’s right to control copies of their work following the first (authorized) sale of the work thereby prohibiting interference into purchaser’s property rights and allowing the purchaser to have control over their copy. This includes the right to resell it free from interference by the copyright owner.\textsuperscript{75} As found by Rub, copyright exhaustion serves an important social function of reducing information costs—without it, buyers will need to inefficiently waste resources inquiring whether they will be able to resell copyrighted work.\textsuperscript{76}

The EU developed the principle of exhaustion primarily from the perspective of enshrining the free movement of goods throughout the EU and standardizing the approach across EU Member States.\textsuperscript{77} This was achieved through the Copyright

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\textsuperscript{76} Guy A Rub, ‘Rebalancing Copyright Exhaustion’ (2015) 64 Emory Law Journal 741.

\textsuperscript{77} Gallacher and Jauss (n 43); Panos Koutrakos, ‘In Search of a Common Vocabulary in Free Movement of Goods: The Example of Repackaging Pharmaceuticals’ [2003] European law review 53; Forrester (n 74).
Directive (also called ‘the InfoSoc Directive’) as well as by the Software Directive, which applied the principles of the Copyright Directive to computer programs, including games and software. There are, however, differences between the two Directives—most notably, the absence in the Software Directive of recitals 28 and 29 of the Copyright Directive. Recital 28 states that protection relates to works incorporated in a tangible article (e.g. a CD-ROM), and that first sale exhausts the right to control resale of that object in the EU. Recital 29 specifically states that exhaustion does not arise in relation to services and on-line services. These provisions reflect the fact that exhaustion is based on the distinction of the rights in the immaterial work and the transfer of material copies of the work, which are traded as goods. Speaking of the 1991 Copyright Directive, the Commission stated that:

‘As to the exhaustion of copyright it must be borne in mind that under the Directive Community exhaustion only applies to the sale of copies i.e. goods, whereas supply through on-line services does not entail exhaustion.’

Consequently, the exhaustion doctrine, as envisaged and developed by the EU Courts, had up until the UsedSoft ruling been applied only to physical copies of a work. As pointed out by Spedicato, however, ‘there is no reason why this principle should become any less necessary in the online distribution of intangible copies’. Nevertheless, the digital context brings difficulties for this doctrine as it is not the original copy being passed along, but a new one. In UsedSoft, despite Oracle’s use of the word ‘licence’ and their determination that it was a true software licence, the EU Court decided that concluding the grant of a continuous licence with a maintenance agreement and downloading a copy of the software formed an indivisible whole transaction, which amounted to ‘a sale’ capable of exhausting Oracle’s right of distribution to the sold copies of the software. The EU Court reasoned that, as the right of distribution had been exhausted, it was impossible for the right holder to object to any subsequent transfers of the software. To limit the application of the principle of the exhaustion solely to copies of computer programs that are sold on a material medium would, according to the EU Court, allow the copyright holder to control

83 Based on the EU Court’s decision in Case 62/79, Coditel SA v Cine Vog Films SE, ECLI:EU:C:1980:84.
84 Spedicato (n 80) 32.
85 Linklater (n 59) 13.
86 Case C-128/11, UsedSoft, para 68.
the resale of copies downloaded from the internet and to demand further remuneration on the occasion of each new sale, even though the first sale of the copy had already enabled the right holder to obtain an appropriate remuneration. Therefore, any second-hand acquirer must also be a lawful acquirer with the right to reproduce the program for the purposes of its intended use. To reinforce the aforementioned ‘functional equivalents’ towards online–offline transmission, the EU Court advised that, in practice, the original acquirer would have to make their own copy unusable for resale, just as it would be if the program was sold on a tangible medium.

While Stothers notes that the ruling in Usedsoft shows ‘a continuing commitment by the ECJ to ensure that technological change does not reintroduce territorial restrictions in Europe’, Torremans concludes from this judgment that copyright is obviously not the dominant factor in the digital era and that dominance is given to the rules on free movement and on competition law. There has consequently been broad speculation about how this decision could impact other digital goods such as e-books and digital music. Based on the provisions of recitals 28 and 29 to the Copyright Directive, one could conclude that the EU Court’s judgment in UsedSoft should not be extended to include other forms of digital media. Nevertheless, Targosz pointed out that in order to solve the issue of online exhaustion, ‘literal interpretation will not be of much help’ and Linklater emphasized that:

‘UsedSoft signals the start of a new beginning. As we enter this brave new world, the Copyright Directive will be read anew: misalignments in the treatment of physical and digital content will be resolved . . . With UsedSoft as a precedent, the Court can do nothing but keep expanding its own ruling . . . it is only a matter of time until the digital first sale meteor strikes non-software downloads also’.

Consequently, with the EU Court’s commitment to online–offline equivalence and its establishment of an EU wide definition of ‘sale’ to be applied to both tangible and intangible property, it has been put forward that the EU Court will also interpret the Copyright Directive exhaustion provisions as applying to tangible and intangible property in the future.

87 ibid para 63.
88 Stothers (n 59) 789.
89 Paul LC Torremans, ‘The Future Implications of the Usedsoft Decision’ (CREATe Working Paper 2014/2, February 2014). Torremans builds his critics of UsedSoft ruling upon the US District Court of New York decision in ReDigi (Capitol Records, LLC v ReDigi Inc., US District Court for the Southern District of New York, 30 March 2013, No. 12 Civ. 95 (RJS)), where the US court rejected the application of the first sale doctrine as a defence for the copyright infringement by the resale via an online market place of digital used music. Torremans concludes that ReDigi is ‘a decision rooted in copyright’ that is the ‘starting point and the highest norm’ of the US Constitution. He therefore concludes that there is ‘no obvious reason why the same conclusion could not apply in an EU context too’ – ibid 3. See also Linklater (n 59) 17.
90 Tomasz Targosz, ‘Exhaustion in Digital Products and the “Accidental” Impact on the Balance of Interests in Copyright Law’ in Global Copyright (Edward Elgar Publishing 2010).
91 Linklater (n 59).
92 Gallacher and Jauss (n 43).
Nevertheless, in the highly anticipated Allposters decision, the EU Court tied the principle of copyright exhaustion to a physical medium, not allowing for the possibility of exhaustion for digital content falling under the Copyright Directive.

In contrast to this, however, the EU Court’s equivalent approach to digital and physical goods is further supported by its ruling in Darmstadt, where the EU Court made no difference between the photocopying of books that are physically present in a library and in printing a digital copy of the same book. The EU Court held that the Copyright directive does not prevent Member States from granting libraries the right to digitise the books from their collections, if it becomes necessary, for the purpose of research or private study, to make those works available to individuals through dedicated terminals. The right of libraries to communicate, by dedicated terminals, the works they hold in their collections would risk being rendered largely meaningless, or indeed ineffective, if they did not have an ancillary right to digitise the works in question. The EU Court held, however, that the right of communication, which may be held by publicly accessible libraries, does not permit individuals to print out the works on paper or store them on a USB stick from dedicated terminals—although Member States may, within the limits and conditions set by the directive, provide for an exception or limitation to the exclusive right of reproduction of right holders and thus permit library users to print the works out on paper or store them on a USB stick, provided that fair compensation is paid to the copyright holders.

Moreover, it is important to note that in the recent case VOB v Stichting Leenrecht Advocate General Szpunar adopted ‘dynamic’ or ‘evolving’ interpretation of the Directive 2006/115/EC on lending rights related to copyright, thereby taking account of the rapid technological development in this sector. This Directive provides the exclusive right to authorize or prohibit loans of books to the author; in case Member States permit public lending, fair remuneration to the authors needs to be assured. Advocate General Szpunar took the view that lending by public libraries of electronic books also came within the scope of the directive, even though the EU legislature had not contemplated the inclusion of the lending of electronic books. Advocate General thus considered electronic lending as ‘the modern equivalent of the lending of printed books’.

Despite the latest case law concerning e-books and other forms of digital content the development of technology has already moved into new formats such as cloud computing.
computing.102 It remains open to speculation how relevant the legal issues surrounding digital files will be for clouds, where users do not own copies of software on their hard drives but instead make use of such software via the cloud—with cloud users buying access to creative content, not the content itself, although cloud storage shares many of the same characteristics as the electronic devices and hardware. It is therefore largely up to the Commission to catch up with this development in the announced reform of EU copyright rules that are according to the Commission needed to respond to new technologies, consumer behaviour and market conditions’.103

**Taxation**

Another aspect of EU law where digital goods need to be examined in view of the goods and services distinction concerns taxation. In this field, digital goods are generally considered services, not goods. Consequently, before 1 January 2015, the supply of services between businesses (B2B services) was, in principle, taxed at the customer’s place of establishment, while services supplied to private individuals (B2C services) were taxed at the supplier’s place of establishment. This allowed companies like Amazon, Microsoft, Apple and Google to set up small offices in countries with favourable VAT rates and register all their European sales there. Luxembourg’s ‘super-reduced’ VAT rate on e-books (just 3 per cent) thus meant that it became home to Amazon’s European headquarters. The new Directive 2008/8/EC104 that became effective as of 1 January 2015 intended to shut down this tax loophole being used by big firms to charge less VAT on digital goods in that it provides that telecommunications, broadcasting and electronic services provided to a non-taxable person are, in all cases, taxable at the place where the customer is located.105 Accordingly, although considered services, digital goods now experience the same VAT treatment as the sales of goods, where in principle the location of the buyer determines the VAT rate. Consequently, when a Slovenian company is selling CDs over the Internet to private customers in Denmark, the Danish VAT must be charged when the Danish threshold is exceeded. The same is also now true for music sold in electronic form only.

Nevertheless, VAT treatment of digital and physical goods is not completely levelled as the EU Court recently refused to afford digital goods the same VAT status as is given to paper books. In the aforementioned cases *Commission v Luxembourg and France*106 the EU Court held that the reduced VAT rate is applicable only to transactions consisting of the supplying of books found on a physical medium and

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102 Peter Mell and Tim Grance, ‘Perspectives on Cloud Computing and Standards’ [2009] USA, NIST.
103 Communication from the Commission, A Digital Single Market Strategy for Europe (n 2). In this respect it should be noted that the recently agreed Network and Information Services (NIS) Directive (based on COM (2013) 48 final), the first EU-wide legislation on cybersecurity also covers cloud computing.
105 Art §8 of the VAT Directive. For more detail, see European Commission, Explanatory notes on the EU VAT changes to the place of supply of telecommunications, broadcasting and electronic services that enter into force in 2015, 3 April 2014.
rejected the argument that the supply of electronic books constituted a supply of goods (and not a supply of services). Only the physical support enabling an electronic book to be read could qualify as ‘tangible property’ but such support is not part of the supply of electronic books.107 The principle of equivalence between online and offline property declared in UsedSoft therefore does not apply to VAT.

Consequently, Members of the European Parliament have asked the Commission to take urgent action to align VAT rates for electronic books and press with those applied to paper publications108 and culture ministers of France, Germany, Poland and Italy wrote to the Commission demanding a review of the VAT regulations so they can align the tax levels for all books published in all forms. The statement of the latter says:

‘Whether it is digital or printed, it is the content that makes the book, not the way the reader has access to it. A book is a book no matter what its form is. For these reasons, we share the belief that it is necessary to apply the same reduced rates of VAT to both digital and printed books. Technology-neutral regulations must be clearly asserted at the European level so that innovation and the development of e-books are not jeopardized.’109

In this Declaration, the ministers asked the Commission to propose European legislation that would allow reduced tax rates of VAT for all books whether they are printed or digital. In response, the Commission recognized in its recent digital strategy that the ‘complications of having to deal with many different national systems represent a real obstacle for companies trying to trade cross-border both on and offline’ and said it will explore ‘how to address the tax treatment of certain e-services, such as digital books and online publications, in the context of the general VAT reform’.110 Under this reform, however, the Commission will have to think through not only aspects of cultural diversity in respect of various media on which culture can be offered to the people,111 but also environmental aspects, considering the environmental impact of paper books and newspapers in comparison to e-books and e-news. In any case, keeping the advantageous VAT position of paper books does not seem plausible in the long-term.

**Consumer protection**

Finally, there are also important legal consequences of affording digital products ‘goods or services’ status under contract and consumer protection law. Under

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107 ibid para 35.
111 cf Joint Cases 60/84 and 61/84, Cinéthèque v Fédération Nationale de Cinemas Francaises, ECLI:EU:C:1985:329, where the EU Court accepted protection of cinemas as a justified restriction on free movement of goods for reasons of legitimate protection of cultural diversity. See also Case C-353/89, Commission v Netherlands, ECLI:EU:C:1991:325, concerning national radio and television programmes.
national laws of the EU Member States, it has often been accepted that a digital product falls outside the definition of goods\textsuperscript{112}—more often because it is difficult to apply certain provisions for the sales of goods laws to digital goods (eg provisions on the transfer of property and those on delivery). Nevertheless, digital goods supplied to consumers may potentially cause a consumer significant damage (eg a bug in a program might cause loss of data in which the consumer has invested time and money causing not only economic damage, but also disappointment or distress). It is unclear, however, whether consumers who buy digital goods enjoy the same legal protection as when they purchase physical goods. In absence of appropriate legislation, it has been left to the courts to establish the standards of consumer protection in situations, when they were buying digital goods by applying pre-digital age legislation.\textsuperscript{113}

Despite this conservative approach of lawmakers in Europe, the 2011 EU Consumer Rights Directive has made a step forward in this field by consolidating specific rules on pre-contractual information, formal requirements and the right of withdrawal. Nevertheless, the Directive does not treat digital products as goods or as services, rather as ‘contracts for the supply of digital content which is not supplied on a tangible medium’ which are distinguishable from sales contracts and service contracts.\textsuperscript{114} Although many provisions of the Directive apply generally to all types of contracts under the Directive, some rules depend on the classification of the contract—eg provisions on the right to withdrawal.\textsuperscript{115} It is particularly important, however, that in contrast to the sales and service contracts the Directive does not mention ‘payment’ as an essential term for online digital content contracts, meaning that the Directive for example applies also to a contract for a free download of a game from an app store. This ‘omission’ is vital considering that consumers are often offered ‘free’ content in exchange for personal data that are, consequently, mone-
tised.\textsuperscript{116} The 2015 proposal for a directive concerning contracts for the supply of digital content continues along this path by regulating contracts established in exchange

\footnotesize{\textsuperscript{112} See eg Lord Justice Glidewell in the case \textit{International Computers Ltd v St Albans District Council}, [1996] 4 All ER 481. For comparison, the Uniform Commercial Code’s (UCC) proposal to amend art 2 definition of goods so as to include information (including eg software) did not get sufficient support— however, art 471 of Louisiana’s Civil code defines corporeal movable property so as to include ‘digital or electronic products such as audio and video downloads’.

\textsuperscript{113} Bradgate (n 21) 7–10.

\textsuperscript{114} Recital 19 of the Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, OJ L 304, 22.11.2011, pp 64–88. Recital 19 also clarifies that the Directive considers digital content supplied on a tangible medium, such as a CD or a DVD, as goods. This is in line with the aforementioned EU Court’s decision in Case C-244/06, \textit{Dynamic Medien Vertriebs GmbH v Avides Media AG}, ECLI:EU:C:2008:85.

\textsuperscript{115} The right of withdrawal is not recognized if the performance of digital content has begun with the consumer’s prior express consent and his acknowledgment that he thereby loses his right of withdrawal (see art 16(m)). This provision is thus similar to that in art 16(i) exempting sealed tangible data carriers (CDs, DVDs etc.) from the right of withdrawal if the consumer unseals them. This means that in both these cases, unlike that of the withdrawal from the provision of services, the consumer has no right to ‘test’ the digital content during the right of withdrawal period—EU Commission, DG Justice Guidance document concerning Directive 2011/83/EU, 2014, p 64, <http://ec.europa.eu/justice/consumer-marketing/files/crd_guidance_en.pdf> accessed 27 August 2016.

for data, thereby providing that if a consumer has obtained digital content or services in exchange for personal data, the supplier must refrain from using such data in case the contract is terminated.\textsuperscript{117}

However, adaptation of consumer law to ‘the digital age’ as announced in the Commission’s Consumer Agenda,\textsuperscript{118} has not been achieved in areas such as legal guarantees and unfair contract terms. As recognized by the Commission itself in its recent Digital Strategy, ‘when it comes to remedies for defective digital content purchased online (such as e-books) no specific EU rules exist at all, and only few national ones’. The Commission therefore announced putting forward ‘clear contractual rules for online sales of both physical goods like shoes or furniture and digital content, like e-books or apps’.\textsuperscript{119} This should create a level-playing field for businesses and boost consumer trust in online purchases. It was hoped, however, that this strategy would include continuing the modernization processes started with the Consumer Rights Directive and not just going further with the proposed but later withheld Regulation on a Common European Sales Law (CESL).\textsuperscript{120} The latter indeed constituted an important step forward in terms of guaranteeing legal certainty in relation to digital products;\textsuperscript{121} it was foreseen, however, that it would have presented an optional legal system for consumer contracts and thus would not give comparable levels of protection for consumers to the adoption of a specific directive on digital goods or by revising the 1999 Sales of Goods Directive\textsuperscript{122} that currently applies only to tangible goods. This optional nature of CESL did not make it sufficiently solid legislation in terms of consumer protection against defective digital content compared to the guarantees for physical goods. The same can also be said for the Commission’s Communication on Cloud Computing,\textsuperscript{123} where it has announced another optional regime for such services. In contrast to this, if the Commission actually wants to boost consumer confidence in the digital market, consumers should be given rights ‘corresponding’ to those given to purchasers of physical goods when buying digital goods—without the need to define digital goods as goods. In this respect it may be seen as an encouraging development that in line with the Digital

\textsuperscript{117} See Fact Sheet, MEMO 15-6265.


\textsuperscript{119} Communication from the Commission, A Digital Single Market Strategy for Europe (n 2).

\textsuperscript{120} Communication from the Commission, A Common European Sales Law to Facilitate Cross-Border Transactions in the Single Market, COM (2011) 635 final.

\textsuperscript{121} The proposed and now withdrawn CESL contained specific rules for digital content products, such as consumer remedies for a lack of conformity. Furthermore, recital 17 of its preamble recognises: ‘The transfer of digital content (…) is still surrounded by a considerable degree of legal diversity and uncertainty. The Common European Sales Law should therefore cover the supply of digital content irrespective of whether or not that content is supplied on a tangible medium’. In its 2015 Work Programme adopted in December 2014, the Commission indicated that it intends to modify the proposal—also in view of its new Digital Strategy.


Strategy a proposal for a directive was published in December 2015, recommending the regulation of supplier’s liability for defects with a reversed burden of proof in accordance with which it would be up to the supplier to prove that no defect existed and not vice versa. Article 6 of the proposed directive defines a defect in respect of digital content as any flaw that does not conform to ‘what was promised in the contract’. In case the contract does not make such specifications, objective criterion shall be applied, such as the circumstances that the digital content is not fit for the purpose for which it would normally be used. Consumers would have the right to terminate long-term contracts and contracts to which the supplier would make considerable changes, ‘without a time limit for the supplier’s defect liability’ because unlike goods digital content is not subject to wear and tear. Nevertheless, this regulatory development in the field of EU consumer law further evidences the complexity of digital goods and the hardships to afford them the same legal status as is afforded to physical goods or ‘traditional’ services. Consequently, while faulty physical goods are normally returned to the seller, this is much harder in respect of the digital goods. Article 13 of the proposed directive thus only states that the supplier shall reimburse the price or if the counter-performance consisted of data refrain from using these data, while the consumer shall refrain from using further the digital content after termination.

CONCLUDING REMARKS

There are an increasing number of calls to unify legal rules for physical and digital goods—by scholars, consumer organizations, MEPs and national (culture) ministers. Although the digital era considerably challenges the traditional way of legal reasoning, it may be concluded that, at EU level, the before-mentioned Hunnings’ ‘conceptual blockage’ in the minds of the lawyers is being increasingly overcome. The EU Court has made an important step forward in comparison to the time when electricity was the only intangible ‘product’ treated under the free

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125 cf the Dutch case Silicon Biomedical Instruments BV v Erich Jaeger GmbH (see supra fn 67 <http://cisgw3.law.pace.edu/cases/060628n1.html>), where District Court Arnhem observed defects of the software sold to hospitals (attaching data to wrong patient, unattainability of data, abnormal system ends) and concluded that these defects were so serious that normal and elementary use of the software for the purpose it was designed for (use in a busy medical environment) was prevented. Although the court found that it has to be tolerated that new developed software may have ‘teething troubles’ or ‘start-up problems’ in the beginning, it must be possible to use the software in a normal way from the beginning on. cf Olaf Fiss, Die Haftung Für Fehlerhafte Software Im Wettbewerb Der Rechtsordnungen: Eine Rechtsvergleichende Analyse (Peter Lang 2013).
128 eg Bradgate (n 21) 55.
movement of goods, by establishing the principle of equivalence between digital and physical goods and by treating online and offline modes of transmission (or supply) as functional equivalents in the field of copyright. The same cannot, however, be said for the field of taxation, where digital goods are considered as services and more favourable VAT treatment of traditional paper books and newspapers than e-books and e-media is in force. It is therefore for the EU legislators to fill this regulatory gap, although it may also be admitted that the EU Court does not merely apply these sets of rules, but actively co-creates EU law, placing it in a position to contribute to progressive convergence of rules on goods and services into an integrated system of rules.

Finally, in the field of consumer protection digital goods are neither considered as goods nor as services, but as a *sui generis* ‘product’. Nevertheless, this special treatment of digital goods by the 2011 Consumer Rights Directive and the now withdrawn CESL corresponds to the Hunnings’ call for a lawyers’ ‘move to quantum physics’ considering several specific characteristics of digital goods that do not correspond to some concepts of traditional contract law. The Directive even covers digital goods that are obtained without paying a fee, taking into account the economic value of personal data normally obtained by the suppliers in exchange for the transmission of digital goods, which is admittedly an innovation that proves EU lawmakers have overcome the alleged ‘conceptual blockage’.

It may be concluded from the foregoing that despite the fact that digital goods may in certain aspects be comparable to physical goods and in other aspects to services, it is with the present state of EU law safer to treat them as a legal category *sui generis* with specific characteristics and legal consequences rather than classifying them categorically into one or the other group without examining specific characteristics of various forms of digital goods. This would lead to oversimplifications and improper legal solutions for the consumers (such as regarding the issues of payment, withdrawal and remedies). Moreover, even when it is possible to establish a level playing field for trade with physical and digital goods this should not be a one-way process in which the scope of pre-digital era rules is simply broadened to cover digital goods.

Regulatory sensitivity of digital goods as product-service system *sui generis* may be evident from the hardships of regulating service supplier liability at the EU level. Although the draft proposed in 1990 was based on a fault-based liability regime (rather than on a strict liability one), there was no political will for its adoption,131 which is increasingly important considering that the Product Liability Directive132 does not apply to intangible goods, including non-embedded software or digital design files for 3D printed objects that are sold to customers who later prints the object themselves.133

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133 It is nevertheless important to note, however, that if damage is caused by a defective product used in the provision of a service, it will be recoverable under the Product Liability Directive (See Case C-203/99,
‘Technology-neutral regulations’ as demanded by some EU culture ministers is thus not appropriate in every legal aspect. What is needed is an overall assessment of suitability of the established rules for the modern society in line with the values protected by the EU and with the need to establish appropriate balances among conflicting values. The central problem might be, that this balance is sometimes inconsistent, for example in UsedSoft the EU Court favoured internal market goals over copyright, whereas broader application of the principle of purchaser for VAT purposes as set in force since 1 January 2015 further fragmentises the internal market. Conversely, the recent EU Court’s ruling that prohibits application of the reduced VAT rate for e-books and e-news supports the internal market but contravenes EU political orientations in the field of support for diversity of cultural media. The Commission’s revealed Digital Strategy should thus predominantly be considered as an opportunity for an EU-wide discussion on importance of copyright, single market, culture, environmental and consumer protection in the digital era and how the established rules in these domains suit digital goods. Since these questions will be considered by various decision-making forums, it is unlikely, however, that digital goods will be categorized as physical goods within all of the relevant legal domains. The gap between the Newton and quantum world is thus likely to persist for the near future.

Veedfald v Arhus Amtskommune, EU:C:2001:258 and Case C-495/10, Dutreux, EU:C:2011:869). Many servitization transactions will thus come within the ambit of this Directive, including flawed software that is stored on a tangible medium (Written Question No 706/88 by Gijs de Vries to the Commission: Product liability for computer programs, OJ C 114, 8.S.1989, 42), nowadays in particular in smart objects, faulty 3D printed objects and car sharing services with a defective car.