TO BOLDLY GO, PART II: DATA AS THE *CISG*'S NEXT (BUT PROBABLY NOT FINAL) FRONTIER

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The United Nations Convention on Contracts for the International Sale of Goods ('CISG') is an international sales law treaty concluded in 1980 and drafted with traditional (physical) goods trade in mind. While a significant body of scholarship has addressed its capacity to govern electronic software transactions, only limited commentary has explored the CISG's digital application beyond software per se. 'To Boldly Go, Part I', this article's counterpart, developed a specific legal framework for assessing the CISG's capacity to regulate international trade in non-software data. This article now applies that framework, confirming the CISG is capable of governing non-software data trade, and uses that framework to resolve the currently unsettled question of whether cryptocurrency trade falls within the CISG's scope. Since non-software data trade is becoming increasingly economically important, this article's conclusions stand to benefit data traders as well as the practitioners advising them.

I INTRODUCTION

Like the globalisation of trade,[1] business digitalisation is an inescapable phenomenon. In a recent edition of the Herbert Smith Freehills *Catalyst* podcast, the vast majority of poll respondents identified 'digital transformation' as the 'big-ticket agenda [item] you think will present the biggest challenge to your business in the next three years': ahead of cyber security, environmental, social, and governance issues, operational resilience, and regulatory change.[2] In explaining this poll result, the following observations were made:

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1 Camilla Baasch Andersen, 'A New Challenge for Commercial Practitioners: Making the Most of Shared Laws and Their "Jurisconsultorium"' (2015) 38(3) *University of New South Wales Law Journal* 911, 911.

2 'EP61 Catalyst: Exploring Opportunities', *Catalyst Podcast Series* (Herbert Smith Freehills, 23 September 2020) 0:04:54–0:06:34 <https://www.herbertsmithfreehills.com/latest-thinking/catalyst-the-podcast-series-for-an-era-of-change> ('Exploring Opportunities').

> [T]he fact is, it's complex, it touches almost every aspect of our businesses, and the stakes are very high. So the nirvana promise, of course, is that if you get it right, it's unlike anything we've seen before. It could bring about the ability to optimise existing services and business models, opportunities to create entirely new sources of value, the promise of greater efficiencies, lower costs …[3]

Amongst the many activities affected by business digitalisation sits 'commercialisation of that oh-so-valuable asset, data'.[4] But what law underpins, and supports, such data trade? This question was identified by *Catalyst* as a 'key' issue engaging the business world.[5] It is also the question I address in this article, and in its 'To Boldly Go, Part I' counterpart: with reference to the *United Nations Convention on Contracts for the International Sale of Goods* ('*CISG*').[6] The *CISG* has been adopted by Australia[7] and 93 other Contracting States, including most of the world's major trading nations.[8]

This analysis is timely. Business digitalisation was 'high on the board agenda even before COVID-19, but has been brought into sharper focus as a result of this pandemic'.[9] Data is regularly described as the new oil.[10] As Trakman, Walters and Zeller explain, 'information is valuable as a commodity; and it is not surprising that companies specialize in harvesting and mining data … in order to sell that data as a

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3 Ibid 0:06:47–0:07:19.

4 Ibid 0:09:15–0:09:21. See also 'How In-House Lawyers Can Help Their Companies Achieve Digital Transformation', *The Allen & Overy Podcast* (Allen & Overy, 26 September 2019) 0:08:18–0:08:30 <https://allenovery.podbean.com/e/how-in-house-lawyers-can-help-their-companies-achieve-digital-transformation/>.

5 'Exploring Opportunities' (n 2) 0:11:15–0:11:27.

6 *United Nations Convention on Contracts for the International Sale of Goods*, opened for signature 11 April 1980, 1489 UNTS 3 (entered into force 1 January 1988) ('*CISG*').

7 For Australia's implementing legislation: see *Sale of Goods (Vienna Convention) Act 1987* (ACT) s 5; *Sale of Goods (Vienna Convention) Act 1987* (NI) s 5; *Sale of Goods (Vienna Convention) Act 1986* (NSW) s 5; *Sale of Goods (Vienna Convention) Act 1987* (NT) s 5; *Sale of Goods (Vienna Convention) Act 1986* (Qld) s 5; *Sale of Goods (Vienna Convention) Act 1986* (SA) s 4; *Sale of Goods (Vienna Convention) Act 1987* (Tas) s 5; *Goods Act 1958* (Vic) s 86; *Sale of Goods (Vienna Convention) Act 1986* (WA) s 5; *Competition and Consumer Act 2010* (Cth) sch 2 s 68.

8 'Status of Treaties: *United Nations Convention on Contracts for the International Sale of Goods*', *United Nations Treaty Collection* (Web Page, as at 1 June 2021) <https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=X-10&chapter=10&clang=_en>.

9 'Exploring Opportunities' (n 2) 0:00:39–0:00:48. See also Pascal Hachem, 'Anhang zu Art 1: *CISG* und Datenhandel' in Peter Schlechtriem, Ingeborg Schwenzer and Ulrich G Schroeter (eds), *Kommentar Zum UN-Kaufrecht (CISG)* (CH Beck, 7th ed, 2019) 78, 78–9 [1] ('Annex').

10 Ajay Agrawal, Joshua Gans and Avi Goldfarb, *Prediction Machines: The Simple Economics of Artificial Intelligence* (Harvard Business Review Press, 2018) 43; Leon Trakman, Robert Walters and Bruno Zeller, 'Trade in Personal Data: Extending International Legal Mechanisms to Facilitate Transnational Trade in Personal Data?' (2020) 6(2) *European Data Protection Law Review* 243, 243 ('Trade in Personal Data'). See also 'Exploring Opportunities' (n 2) 0:44:56–0:45:32; 'Fintech in Focus: Digital Identity', *Freshfields TQ Podcast Series* (Freshfields Bruckhaus Deringer, 22 September 2020) 0:04:20–0:04:32 <https://www.freshfields.com/en-gb/our-thinking/our-podcasts/technology-quotient-podcast/fintech-in-focus-digital-identity/> ('Digital Identity'); 'The Impact of COVID-19 on Digital Transformation and the Importance of Continued Innovation', *DLA Piper TechLaw Podcast Series* (DLA Piper, 22 September 2020) <https://soundcloud.com/user-70946062/the-impact-of-covid-19-on-digital-transformation-and-the-importance-of-continued-innovation> 0:06:28–0:07:08 ('Continued Innovation'); 'A Turning Point for Tech: Global Survey on Digital Regulation', *Straight Talking from Hogan Lovells* (Hogan Lovells, 6 November 2019) 0:06:39–0:06:48 <https://hlstraighttalks.podbean.com/e/a-turning-point-for-tech-global-survey-on-digital-regulation/>.

product to interested parties'.[11] Digital assets, today, are 'hardly unusual, uncommon or of little value; in fact, quite the opposite is true'.[12] Contracts for the sale of data, however, do not exist in a legal vacuum.[13] Identifying and understanding the law that governs them will help businesses and their legal advisers (including those in Australia) effectively engage with this increasingly important area of international economic activity.

The *CISG* is a widely adopted treaty that is intended to harmonise international sales law, and thereby promote international trade.[14] It was drafted in 1980, firmly in the context of physical goods trade.[15] Most existing authorities accept the *CISG*'s capacity to govern electronic software transactions.[16] As explained in 'To Boldly Go, Part I', however, a range of other non-software digital assets are now commonly traded: including media files, apps, and raw data. Such non-software data is qualitatively different to software, which is traditionally understood as comprising executable computer programs only.[17] Non-software data does not consist of executable files, and in some cases, is not functional in and of itself.[18] Media files and raw data, for example, require software or apps to operate upon them in order to be useful. Accepting the *CISG*'s capacity to regulate software trade does not, therefore, automatically establish that non-software data falls within the

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11 Trakman, Walters and Zeller, 'Trade in Personal Data' (n 10) 244. See also Organisation for Economic Co-operation and Development, 'Government Access to Personal Data Held by the Private Sector: Statement by the OECD Committee on Digital Economy Policy', *Digital* (Web Page, 22 December 2020) <http://www.oecd.org/digital/trusted-government-access-personal-data-private-sector.htm>; 'Digital Identity' (n 10) 0:04:24–0:04:32; 'Maximising Value from Data: Data Governance and Data Monetisation', *The Allen & Overy Podcast* (Allen & Overy, 28 January 2020) 0:00:30–0:00:42 <https://allenovery.podbean.com/e/maximising-value-from-data-data-governance-and-data-monetisation/> ('Maximising Value from Data').

12 Sarah Green, 'Sales Law and Digitised Material' in Djakhongir Saidov (ed), *Research Handbook on International and Comparative Sale of Goods Law* (Edward Elgar Publishing, 2019) 78, 93–4 ('Sales Law').

13 As is the case for contracts in general: *Amin Rasheed Shipping Corporation v Kuwait Insurance Co* [1984] 1 AC 50, 65.

14 *CISG* (n 6) Preamble para 3.

15 See, eg, Clayton P Gillette and Steven D Walt, *The UN Convention on Contracts for the International Sale of Goods: Theory and Practice* (Cambridge University Press, 2nd ed, 2016) 53; Peter Huber and Alastair Mullis, *The CISG: A New Textbook for Students and Practitioners* (Sellier European Law Publishers, 2007) 111–12; Edgardo Muñoz, 'Software Technology in *CISG* Contracts' (2019) 24(2) *Uniform Law Review* 281, 287; Mirjam Eggen, 'Digitale Inhalte unter dem *CISG*: Eine Rundschau über Herausforderungen und mögliche Lösungen' (2017) 17(6) *Internationales Handelsrecht* 229, 233.

16 See, eg, Ingeborg Schwenzer and Pascal Hachem, 'Article 1' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 27, 34–5 [18].

17 Benjamin Hayward, 'What's in a Name? Software, Digital Products, and the Sale of Goods' (2016) 38(4) *Sydney Law Review* 441, 452–4; *Australian Competition and Consumer Commission v Valve Corp [No 3]* (2016) 337 ALR 647, 676–7 [138]–[139], 679–80 [156]: regarding Australia's non-harmonised sales and consumer laws. See also *Oxford English Dictionary* (online at 1 June 2021) 'software' (def 2(b)); *Oxford English Dictionary* (online at 1 June 2021) 'data' (def 2(b)); *A Dictionary of Computer Science* (online at 1 June 2021) 'data' (def 1).

18 Hans Markus Wulf, *UN-Kaufrecht und eCommerce: Problembereiche bei der Anwendung des Wiener Übereinkommens auf Internet-Verträge* (Peter Lang, 2003) 51; Hansjörg Friedrich Schmitt, *Intangible Goods als Leistungsgegenstand internationaler Online-Kaufverträge* (Peter Lang, 2003) 19–20. In this regard, raw data is similar to raw materials: Hachem, 'Annex' (n 9) 82 [12].

CISG's scope too. Independent analysis, of the kind undertaken in this article and in its counterpart, is required to reach that conclusion.

'To Boldly Go, Part I' laid the foundation for this independent analysis. In that article, I established a specific legal framework for assessing the *CISG*'s capacity to regulate non-software data trade. That framework consisted of three elements: *CISG* article 1(1)'s goods criterion, *CISG* article 1(1)'s sale criterion, and *CISG* article 3's rules on mixed contracts. *CISG* article 1(1)'s goods criterion determines whether non-software data falls within the *CISG*'s scope as a matter of principle. The *CISG* article 1(1) sale criterion, and *CISG* article 3's rules on mixed contracts, determine whether *particular* non-software data contracts fall within the *CISG*'s scope. In relation to *CISG* article 1(1)'s threshold goods criterion, 'To Boldly Go, Part I' set out the interpretative principles that determine whether or not non-software data constitutes goods for the purposes of the *CISG*.

In Part II of this article, I progress that analysis and *apply CISG* article 1(1)'s goods criterion to non-software data. As in 'To Boldly Go, Part I', media files (audio, video, image, and document files), apps, and raw data (including personal data) are analysed by way of example. Part II concludes that non-software data does constitute goods for the purposes of *CISG* article 1(1). Taken alongside 'To Boldly Go, Part I', this analysis confirms that non-software data trade can be governed by the *CISG*, a conclusion that is significant for a range of practical and policy reasons that were canvassed in that prior article. These include the magnitude of data trade,[19] and the *CISG*'s trade facilitation purposes.[20]

Part III takes this analysis one step further, by using it to resolve a specific and currently unsettled question concerning the *CISG*'s digital operation: can the *CISG* regulate cryptocurrency sales? That is, can the *CISG* regulate the exchange of cryptocurrency against traditional State-issued money?[21] Existing analyses both support[22] and reject[23] the proposition that it can. As cryptocurrencies did not exist when the *CISG* was drafted, its text provides no explicit solution.[24] My analysis of the *CISG*'s capacity to govern non-software data trade provides a proper foundation for this issue's principled resolution: a foundation missing from the

19 Hachem, 'Annex' (n 9) 78 [1].

20 *CISG* (n 6) Preamble para 3.

21 Eggen (n 15) 236–7.

22 Frank Spohnheimer, 'Article 2' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 39, 50 [40]. Spohnheimer, however, cites Manuel Lorenz, 'Art 2' in Wolfgang Witz, Hanns-Christian Salger and Manuel Lorenz (eds), *International Einheitliches Kaufrecht: Praktiker-Kommentar und Vertragsgestaltung zum CISG* (dfv Mediengruppe, 2nd rev ed, 2016) 32, 36 [8] with reference to this proposition: a source actually arguing against the *CISG*'s application to cryptocurrency trade: at 50 [40].

23 Lorenz (n 22) 36 [8]; Eggen (n 15) 236–7; Emir Bayramoğlu, 'A Legal Analysis on *CISG*'s Scope of Application from Smart Contracts' Perspective', *Turkish Law Blog* (Blog Post, 20 January 2020) <https://turkishlawblog.com/read/article/193/a-legal-analysis-on-cisg-s-scope-of-application-from-smart-contracts-perspective>; Koji Takahashi, 'Applicability of *CISG*', *Blockchain, Cryptocurrency, Crypto-Asset and the Law* (Blog Post, 2 November 2015) <http://cryptocurrencylaw.blogspot.com/2015/11/applicability-of-cisg.html>; Tomáš Hůlka, 'Internetové Obchodování s Mezinárodním Prvkem' [Internet Trading with an International Element] (Thesis, Univerzita Karlova, 11 January 2017) 44.

24 Eggen (n 15) 235.

limited existing attempts to resolve this problem. Answering this question is important for jurisdictions (like Australia) which are experiencing growing interest in cryptocurrency investment.[25]

Part IV concludes by reaffirming the proposition put in 'To Boldly Go, Part I': that non-software data trade is the *CISG*'s next frontier, and that by regulating such trade, the *CISG* can boldly go where no existing case law[26] (but where much international trade) has gone before. It is probably not the *CISG*'s final frontier, however, given the *CISG*'s history of successful adaptation to the many commercial and technological changes occurring between 1980 and today.

Before proceeding to Part II, a final introductory remark is necessary regarding my citation style, as was also the case in 'To Boldly Go, Part I'. Limited existing scholarship specifically addresses the *CISG*'s digital application beyond software. As a result, many of the authorities cited in this article instead address software, or the *CISG*'s interpretation in a more general sense. I would ordinarily acknowledge the different contexts of these sources in my footnotes via use of the 'cf' introductory signal, explanatory text (such as 'in the software context'), or both. However, given the large number of citations that would have been affected by these qualifications, I have chosen not to do so in this article.

II NON-SOFTWARE DATA AND *CISG* ARTICLE 1(1)'S GOODS CRITERION: APPLYING AND ADAPTING THE *CISG*'S PROVISIONS TO NON-SOFTWARE DATA TRADE

As Part I explained, the application of *CISG* article 1(1)'s sale criterion and *CISG* article 3's rules relating to mixed contracts are fact dependent. *CISG* article 1(1)'s goods criterion, however, is different. It plays a gatekeeper function: acting as a threshold requirement which determines the *CISG*'s application as a matter of principle.

A A Brief Recap: Interpreting *CISG* Article 1(1)'s Goods Criterion

In establishing my specific legal framework for assessing the *CISG*'s capacity to govern non-software data trade, 'To Boldly Go, Part I' identified the interpretative rules that are relevant to determining whether non-software data constitutes goods for the purposes of *CISG* article 1(1). In summary:

- *CISG* article 7(1) requires that this issue be resolved autonomously.[27]

25 Ann Wen, 'Will We See More Australian Businesses Transact with Cryptocurrency?', *Dynamic Business* (online, 30 September 2020) <https://dynamicbusiness.com/featured/will-we-see-more-australian-businesses-transact-with-cryptocurrency.html>.

26 At the time of writing, searching the *CISG-Online* database's case law collection for decisions involving 'data' in the '[g]oods as per contract' field returns zero results: Faculty of Law, University of Basel, 'Search for Cases', *CISG-Online* (Web Page, 2021) <http://www.cisg-online.org/search-for-cases>.

27 Ingeborg Schwenzer, Pascal Hachem and Christopher Kee, *Global Sales and Contract Law* (Oxford University Press, 2012) 98 [7.05]; Schwenzer and Hachem, 'Article 1' (n 16) 33 [16]; Loukas Mistelis, 'Article 1' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 21, 31

- Applying this principle of autonomous interpretation, the *CISG*'s understanding of goods is a broad one.[28]
- The 'decisive criterion', according to the *Schlechtriem & Schwenzer Commentary*, is 'the suitability of the [*CISG*'s] rules on non-conformity (Article 35 *et seq*)' for the type of trade in question.[29]
- Taking a broader view, beyond just this non-conformity provision, *CISG* article 1(1)'s goods criterion has also been defined 'by taking into account the suitability and adequacy of the *CISG*'s solutions for the merchandise in question'.[30]
- Since there are qualitative differences between software and non-software data, accepting software's classification as goods for the purposes of *CISG* article 1(1)[31] does not in itself determine that non-software data is classified in that same way.[32]

In this Part, *CISG* article 1(1)'s goods criterion is applied in the non-software data context: noting for completeness that *CISG* article 2's exclusions do not capture either software or data trade.[33] While an emerging body of literature has started to explore the *CISG*'s digital application beyond software, there is no existing scholarship that rigorously applies the *CISG*'s legal test for goods to non-software data. The closest existing contributions have been Eggen's and Schmitt's German language analyses of the *CISG*'s application to digital goods and intangible goods, respectively. While Eggen's analysis addresses both *CISG* articles 1(1) and 3,[34] which are the basis of the framework of 'To Boldly Go, Part I', Eggen does not address the suitability of the *CISG*'s provisions as the decisive factor in applying *CISG* article 1(1)'s goods criterion. After briefly reviewing the operation of the *CISG*'s substantive provisions to digital goods trade, Eggen treats their application as following on from the *CISG*'s initial applicability.[35] Schmitt's systematic interpretation of the *CISG* does assess the operation of some of its provisions in addressing whether or not the *CISG* governs intangible goods trade, though only a small number of core obligations are analysed.[36] As 'To Boldly Go,

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[36]; Pilar Perales Viscasillas, 'Article 7' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 112, 116 [12].

28 Schwenzer and Hachem, 'Article 1' (n 16) 33 [16].

29 Ibid. See also Schwenzer, Hachem and Kee (n 27) 98 [7.05], 103 [7.23]; Muñoz (n 15) 285–6.

30 Muñoz (n 15) 285.

31 Peter Schlechtriem, 'Article 1' in Peter Schlechtriem and Ingeborg Schwenzer (eds), *Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 2nd ed, 2005) 23, 28–30 [21]; Thomas Neumann, 'Dominant Control: A Proposal for the Classification of International Transactions of Modern Software' (2017) 21(2) *Vindobona Journal of International Commercial Law and Arbitration* 109, 110, 112, 127.

32 Cf Wulf (n 18) 42–55; Hachem, 'Annex' (n 9) 81 [10]. See also Hachem, 'Annex' (n 9) 83 [16], 88–9 [40].

33 Except, under *CISG* article 2(a), in the consumer context.

34 Eggen (n 15) 230. This reference omits mention of *CISG* article 3, though that provision is addressed elsewhere in Eggen's article.

35 Eggen (n 15) 233–4. Similarly, Wulf assesses the fit of the *CISG*'s performance provisions with virtual goods trade only after determining that the *CISG* applies to such trade in principle: Wulf (n 18) 159–74.

36 Schmitt (n 18) 34–8.

Part I' established, the correct analysis must be more extensive than Schmitt's, and must be conducted in reverse as compared to Eggen's. It is the applicability and adaptability of the *CISG*'s provisions to non-software data trade that provides the legal basis for characterising data as goods for the purposes of *CISG* article 1(1). It is this test that is applied, for the first time, in this Part.

B Methodology: Analysing the 'Muñoz Provisions' in the Non-software Data Context

Assessing any sales law's adequacy to govern trade in digital subject-matters 'is immensely complex and cannot be answered without an extensive examination of [its] … different parts'.[37] Although it is widely recognised that the *CISG*'s 'core provisions on rights and remedies can be applied, if necessary with appropriate accommodation' in the software context,[38] it is interesting to note that most *CISG*-software scholarship does not actually address the *CISG*'s substantive provisions in any kind of detail.[39] Research recently published by Muñoz is a notable exception. That research assesses the compatibility of a range of key *CISG* provisions with software trade: namely *CISG* articles 31–3, 35, 38–9, 42, 66–7 and 79–80.[40] In order to ensure the consistency of my analysis with that of Muñoz, and to ensure that I address a range of legal issues sitting amongst sales law's 'primary concerns',[41] this Part will address those same 'Muñoz provisions' (and select additional *CISG* rules) in the non-software data context.

Part II(D) addresses the seller's delivery obligation, with reference to *CISG* articles 31–3. Part II(E) analyses the seller's conformity obligations, as set out in *CISG* article 35, with additional reference being made to *CISG* article 25's test for fundamental breach and *CISG* article 82(1)'s restitution rule. In Part II(F), examination and notice under *CISG* articles 38–9 are considered, whilst Part II(G) looks to *CISG* article 42's rules regarding third party intellectual property ('IP') claims. Part II(H) addresses the passing of risk under *CISG* articles 66–7, whilst Part II(I) considers *CISG* articles 79–80's liability exemptions. In each case, notwithstanding the inevitable potential for fact-based difficulties, the *CISG*'s provisions are able to be applied and adapted to non-software data trade. This justifies non-software data's classification as goods for the purposes of *CISG* article 1(1).

C Non-software Data Trade and the *CISG*'s Default Status

Before addressing those provisions, however, an initial observation is necessary concerning their default status. Like all of the *CISG*'s rules,[42] the

37 Sarah Green and Djakhongir Saidov, 'Software as Goods' [2007] (2) *Journal of Business Law* 161, 178.
38 Schlechtriem, 'Article 1' (n 31) 30 [21].
39 See, eg, Neumann (n 31) 121; Green and Saidov (n 37) 177–80. See especially ibid 28–30 [21].
40 Muñoz (n 15) 287–9, 293–301.
41 Green, 'Sales Law' (n 12) 85: 'the passing of title and risk, the quality of the goods concerned, their fitness for purpose as well as conformity to their description'.
42 With the exception of *CISG* article 12, concerning written form declarations made under *CISG* article 96: see *CISG* (n 6) art 6.

provisions analysed in this Part apply absent contrary party agreement.[43] In some circumstances, contrary party agreement might be routine or expected, at least in the traditional goods context. For example, contracts commonly contain their own examination[44] and notice[45] regimes, as well as their own risk provisions.[46] In the data context, parties may 'be specific' about what happens to non-software data upon their contract's termination, as well as that data's initial delivery.[47]

A contract's express terms are necessarily adapted to the transaction at hand. Parties are considered the best judges of their own self-interest, and are thus capable of making choices concerning the extent of the *CISG*'s application to their contracts.[48] Where the parties' own agreement in non-software data contracts displaces specific provisions of the *CISG*, their agreement is by definition suitable for their transaction.[49] In addition to Parts II(D)–(I)'s analyses, the *CISG*'s default status thus further confirms the *CISG*'s compatibility with non-software data trade.

D The Seller's Delivery Obligation: *CISG* Articles 31–3

The seller's delivery obligation, addressed in *CISG* articles 31–3, follows on from the seller's general obligations contained in *CISG* article 30 to 'deliver the goods, hand over any documents relating to them and transfer the property in the goods, as required by the contract and this *Convention*'.[50] As delivery constitutes

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43 See, eg, Huber and Mullis (n 15) 106, 151, 314; Ingeborg Schwenzer, 'Article 38' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 636, 641 [11], 650 [29]; Ingeborg Schwenzer, 'Article 39' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 652, 672 [40]; Stefan Kröll, 'Article 38' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 552, 555 [12], 556–7 [18]; Stefan Kröll, 'Article 39' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 586, 591 [15]; Muñoz (n 15) 298.

44 Huber and Mullis (n 15) 150–1; Schwenzer, 'Article 38' (n 43) 641 [11]; Kröll, 'Article 38' (n 43) 557 [19].

45 Kröll, 'Article 39' (n 43) 591 [16].

46 Huber and Mullis (n 15) 314–15; Pascal Hachem, 'Article 67' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 968, 969 [4]; Johan Erauw, 'Article 67' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 861, 862 [3], 865 [24]; B Nicholas, 'Article 67' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 487, 489 [2.1].

47 'Maximising Value from Data' (n 11) 0:12:08–0:12:19.

48 Chief Justice Sundaresh Menon, 'Roadmaps for the Transnational Convergence of Commercial Law: Lessons Learnt from the *CISG*' (Speech, 35th Anniversary of the *Convention on Contracts for the International Sale of Goods* ('*CISG*'), 23 April 2015) 19 [21] <https://www.supremecourt.gov.sg/docs/default-source/default-document-library/media-room/cisg-speech-(final---230415).pdf>.

49 Hachem, 'Annex' (n 9) 85 [24] regarding the *CISG*'s delivery and risk provisions. See, eg, 'Maximising Value from Data' (n 11) 0:08:31–0:08:50, 0:09:12–0:09:52.

50 Corinne Widmer Lüchinger, 'Article 30' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 514, 514–15 [1]–[2]; Burghard Piltz, 'Article 30' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 393, 394 [5]–[6].

'the seller's primary obligation',[51] these provisions are an apt starting point for this Part's analysis.

The *CISG*'s delivery provisions were drafted with physical goods in mind.[52] Of all the provisions addressed in this article, *CISG* articles 31–3 involve the most straightforward analogy with existing *CISG*-software analyses.[53] Notwithstanding the qualitative differences between software and non-software data identified above (and explored in 'To Boldly Go, Part I'), this follows from *CISG* articles 31–3's focus on the means of transmitting goods, rather than their particular characteristics. As data is the fundamental unit of exchange for both software and non-software data trade, it stands to reason that the electronic delivery of both will invoke equivalent principles. This is not to say that applying *CISG* articles 31–3 to non-software data trade is easy.[54] Competing interpretations of these provisions are evident in existing scholarship addressing the *CISG*'s digital operation.

In the software context, Muñoz argues that the means of software's storage and delivery are 'irrelevant', with the 'key principle' being that software's delivery 'occurs at a given time and place in accordance with the agreement of the parties or the *Convention* pursuant to Articles 31–33 of the *CISG*'.[55] Software's intangibility is not incompatible with its capacity to be delivered.[56] The same can be said in relation to non-software data. *CISG* article 33 sets the time for delivery as the date fixed or determinable from the contract,[57] a date within a period fixed or determinable from the contract,[58] or in any other case, 'within a reasonable time' after the contract's conclusion.[59] This provision's application to software trade is straightforward,[60] and the same is true regarding non-software data contracts. While this conclusion is easy to reach, it is important: the time for delivery determines when a buyer is entitled to seek non-delivery remedies under the *CISG*.[61] The most problematic aspect of *CISG* article 33's application to non-software data trade, in practice, is likely to be the factual determination of what constitutes reasonable time. This depends upon the circumstances of each case.[62] One relevant factor will be whether the seller already has the relevant non-software data to hand, or whether that data requires production or procurement.[63] Since *CISG* article 33 regulates the seller's

51 Widmer Lüchinger, 'Article 30' (n 50) 515 [3]. See also Huber and Mullis (n 15) 106; Piltz, 'Article 30' (n 50) 394 [6].
52 Hachem, 'Annex' (n 9) 83 [18].
53 Cf ibid 84 [18].
54 Cf ibid 88–9 [40].
55 Muñoz (n 15) 286.
56 Cf Gillette and Walt (n 15) 50.
57 *CISG* (n 6) art 33(a).
58 Ibid art 33(b).
59 Ibid art 33(c).
60 Muñoz (n 15) 288.
61 Corinne Widmer Lüchinger, 'Article 33' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 571, 572 [2].
62 Huber and Mullis (n 15) 125–6; Burghard Piltz, 'Article 33' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 456, 465 [27].
63 Widmer Lüchinger, 'Article 33' (n 61) 579 [16]; Piltz, 'Article 33' (n 62) 466 [27].

delivery obligation and not the buyer's taking of delivery,[64] delays in transmitting non-software data that are caused by technical difficulties arising after that data's legal delivery are not the seller's responsibility under this provision.

CISG article 31 addresses the content of the delivery obligation, and its place of performance.[65] This provision is also functionally important in establishing the existence of a seller's breach, and a buyer's corresponding entitlement to remedies.[66] It is here that diverging opinions exist regarding digital delivery under the *CISG*. *CISG* article 31's application to non-software data trade thus requires careful interpretation.

CISG article 31 distinguishes between two categories of case:[67] cases involving 'carriage of the goods',[68] and cases involving goods being put 'at the buyer's disposal'.[69] If downloading is the modern form of provision for intangible goods,[70] which category of case does it belong to? Muñoz argues that software's electronic transfer 'is comparable to' carriage, and for this reason, suggests that *CISG* article 31(a) applies.[71] On the other hand, specifically addressing data trade, Hachem suggests that data is usually put at a buyer's disposal via download, and that *CISG* article 31(b) applies instead.[72]

On Muñoz's view, sellers effectively '[hand] the goods over to the first carrier for transmission'[73] by dispatching software from their servers 'for transmission to the buyer through the routing system of different Internet "carriers"'.[74] This carriage analogy seems stronger than Hachem's alternative view, since carriage cases involve different places for the acts of delivery and taking thereof.[75] In the case of non-software data trade, the seller's and buyer's servers will be in different locations, even if a buyer downloads the data they have purchased by clicking on a link.

The Internet infrastructure required for the transfer of non-software data is external to the seller.[76] Data transfers are therefore different from situations involving traditional goods being transported via a seller's own vessel or employees, which are not carriage cases under the *CISG*.[77] Collection analogies also appear artificial

64 Piltz, 'Article 33' (n 62) 457 [3].
65 Corinne Widmer Lüchinger, 'Article 31' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 520, 521 [1]; Burghard Piltz, 'Article 31' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 409, 410 [1].
66 Widmer Lüchinger, 'Article 31' (n 65) 522 [5].
67 Piltz, 'Article 31' (n 65) 413 [13].
68 *CISG* (n 6) art 31(a).
69 Ibid arts 31(b)–(c).
70 Schmitt (n 18) 36.
71 Muñoz (n 15) 288.
72 Hachem, 'Annex' (n 9) 84 [19].
73 *CISG* (n 6) art 31(a).
74 Muñoz (n 15) 288.
75 Piltz, 'Article 31' (n 65) 413–15 [14]–[16].
76 Melissa de Zwart, 'Electronic Commerce: Promises, Problems and Proposals' (1998) 21(2) *University of New South Wales Law Journal* 305, 309.
77 Huber and Mullis (n 15) 111.

as a result of the *CISG*'s presumption in favour of carriage,[78] and the parties' own autonomy to define what delivery act the seller has to perform.[79] Interpreting data transfers as involving carriage is also, importantly, consistent with *CISG* article 7(1)'s interpretative directive regarding 'the observance of good faith in international trade'. Muñoz's delivery-via-carriage interpretation facilitates the *CISG*'s most logical manner of application to a context that its drafters could not possibly have foreseen. The application of *CISG* article 31(a) should therefore not be limited, as Hachem suggests, to situations involving data being transferred via third parties.[80]

Outside of Muñoz and Hachem's analyses, Gillette and Walt critique the potential operation of *CISG* article 31(c)'s 'residual provision' in the software context, where a seller must make goods available to a buyer at the seller's place of business.[81] Both Muñoz and Hachem's views avoid this provision's application by invoking *CISG* articles 31(a) and 31(b) respectively. While there is no difference between them concerning *CISG* article 31(c), for the reasons outlined above, the better view is that non-software data trade is accommodated by *CISG* article 31(a)'s delivery-via-carriage rule.

If this is correct, three further delivery-related observations can be made. First, *CISG* article 31(a) does not require goods to be dispatched from a particular place, unless one is specified in the contract.[82] This point, whilst ostensibly benign, is actually critical to the *CISG*'s commercially reasonable operation in the non-software data context. Mobile communications are ubiquitous in commerce, implicating 'combined mobility of *both* persons and communications'.[83] Given the Internet's borderless nature, data is mobile too. Non-software data might be dispatched by sellers from servers housed at their place of business, outside that place but still within their State, or in some other place (for tax reasons, for example).[84] For *CISG* article 31(a)'s purposes,[85] these variations – all being realistic

78 Piltz, 'Article 31' (n 65) 415 [17], 424 [36].
79 Ibid 416–17 [20].
80 Hachem, 'Annex' (n 9) 84 [20].
81 Gillette and Walt (n 15) 50.
82 Widmer Lüchinger, 'Article 31' (n 65) 522 [4]. See also Piltz, 'Article 31' (n 65) 415–16 [18].
83 Ulrich G Schroeter, 'The Modern Travelling Merchant: Mobile Communication in International Contract Law' (2015) 10(1) *Contratto e impresa/Europa* 19, 19–20 (emphasis added) ('The Modern Travelling Merchant'). See also Luca G Castellani, 'The Electronic *CISG* that Already Is: UNCITRAL Texts on Electronic Contracting' in Ingeborg Schwenzer and Lisa Spagnolo (eds), *The Electronic CISG: 7th MAA Schlechtriem CISG Conference* (Eleven International Publishing, 2017) 41, 50.
84 Schmitt (n 18) 72.
85 And also for the purposes of *CISG* article 1(1)'s internationality criterion: Wulf (n 18) 56, 58.

practical possibilities[86] – are irrelevant. Provided that 'data leaves the server under the seller's control', *CISG* article 31(a)'s delivery obligation is discharged.[87]

Secondly, *CISG* article 31's application has procedural law, as well as substantive law, implications. That provision may serve to establish jurisdiction[88] if relevant private international law rules determine jurisdiction based upon the place of performance (as assessed by reference to a contract's governing substantive law).[89] Since *CISG* article 31(a) does not require that goods be dispatched from a particular place, delivery (for jurisdictional purposes) is taken to occur at the seller's place of business: a solution which avoids the potential for manipulation of this jurisdictional issue.[90] Whilst not affecting *CISG* article 31's suitability for non-software data trade per se, this solution is particularly workable in that context. As non-software data may be dispatched by sellers from servers anywhere in the world, the location of which may not be evident to the buyer, this interpretation of *CISG* article 31(a) avoids artificial jurisdictional results. This reading of the *CISG* is thus also consistent with *CISG* article 7(1)'s interpretative directive regarding 'the observance of good faith in international trade'.

Finally, *CISG* article 31(a)'s application triggers *CISG* article 32's complementary rules.[91] A slight factual adaptation to their application is necessary regarding non-software data trade. *CISG* article 32(1) requires notice of non-software data's 'consignment' as the Internet's procedure for transferring data packets 'makes it impossible for the buyer to identify the full software [or in this case, data] purchased while it is carried through the routing system'.[92] A seller's 'simple communication', notifying the buyer of data's electronic dispatch, would likely suffice.[93] *CISG* article 32(2) also requires sellers to make carriage arrangements: that is, 'such contracts as are necessary' for non-software data's electronic delivery. These could include contracts with data service providers,

86 See, eg, Castellani (n 83) 53–4; Schroeter, 'The Modern Travelling Merchant' (n 83) 25, 39: regarding the *United Nations Convention on the Use of Electronic Communications in International Contracts*, opened for signature 23 November 2005, 2898 UNTS 3 (entered into force 1 March 2013). See also United Nations Commission on International Trade Law, *Report of the Working Group on Electronic Commerce on its Thirty-Eighth Session (New York, 12-23 March 2001)*, UN Doc A/CN.9/484 (24 April 2001) 19–20 [97]–[100]; Jacqueline Mowbray, 'The Application of the *United Nations Convention on Contracts for the International Sale of Goods* to E-commerce Transactions: The Implications for Asia' (2003) 7(1) *Vindobona Journal of International Commercial Law and Arbitration* 121, 131–2: regarding *CISG* article 1(1)'s internationality requirement; Lee A Bygrave and Dan Svantesson, 'Jurisdictional Issues and Consumer Protection in Cyberspace: The View from Down Under' (Conference Paper, Cyberspace Regulation: eCommerce and Content, 24–25 May 2001) [1] <http://www.austlii.edu.au/au/other/CyberLRes/2001/12/> in the consumer contracts context.

87 Muñoz (n 15) 288.

88 Widmer Lüchinger, 'Article 31' (n 65) 523 [5]; Piltz, 'Article 31' (n 65) 427 [46].

89 Widmer Lüchinger, 'Article 31' (n 65) 550 [83]. See, eg, Petra Butler, '*CISG* and International Arbitration: A Fruitful Marriage?' (2014) 17(1) *International Trade and Business Law Review* 322, 326–7.

90 Widmer Lüchinger, 'Article 31' (n 65) 556–7 [93]. Cf Piltz, 'Article 31' (n 65) 424 [37].

91 Piltz, 'Article 31' (n 65) 410 [1]; Burghard Piltz, 'Article 32' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 442, 442 [1], 444–5 [9]–[10].

92 Muñoz (n 15) 288–9. See also Piltz, 'Article 32' (n 91) 445–6 [11]–[13].

93 Huber and Mullis (n 15) 119–20.

such as Internet service providers or mobile networks. These would be contracts relating to the 'means of transportation appropriate under the circumstances',[94] for non-software data as a particular type of goods.[95]

E The Seller's Conformity Obligations: *CISG* Article 35

Like the *CISG*'s delivery provisions, the adequacy of *CISG* article 35's conformity rules for non-software data trade is of significant practical importance. Conformity issues are believed to arise in the 'majority' of sales law disputes,[96] *CISG* article 35 constitutes the 'foundation' of the *CISG*'s non-conformity regime,[97] and it also helps parties allocate commercial risks.[98] Being 'inextricably linked' to the seller's delivery obligation, *CISG* article 35 helps 'define' *CISG* article 1(1)'s goods criterion,[99] as explained in Part II(A).

In contrast to Part II(D)'s examination of delivery, it is here that my analysis sharply diverges from existing *CISG*-software scholarship. Non-software data has its own particular features and uses, affecting *CISG* article 35's potential application. To take just one example, non-software data might not malfunction the same way that software can, where it is non-functional in and of itself.[100] Although the *CISG* is widely accepted as applicable to electronic software trade, some commentaries doubt *CISG* article 35's suitability even in that context.[101] Putting that question to one side, this Part demonstrates that *CISG* article 35 does constitute an appropriate conformity regime for non-software data contracts.

1 CISG Article 35(1): The Parties' Own Contractual Standards

The 'primary test' for conformity, under *CISG* article 35(1), looks to 'the requirements of the contract'.[102] Pursuant to *CISG* article 35(1), sellers 'must deliver goods which are of the quantity, quality, and description required by the contract and which are contained or packaged in the manner required by the contract'.

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94 Piltz, 'Article 32' (n 91) 447 [16].

95 Huber and Mullis (n 15) 120; ibid 450 [24].

96 Stefan Kröll, 'Article 35' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 485, 487 [1]. See also Djakhongir Saidov, 'Article 35 of the *CISG*: Reflecting on the Present and Thinking about the Future' (2013) 58(4) *Villanova Law Review* 529, 529 ('Article 35 of the *CISG*'). Cf Butler (n 89) 330.

97 Kröll, 'Article 35' (n 96) 488 [8].

98 Saidov, 'Article 35 of the *CISG*' (n 96) 529.

99 Ibid.

100 Schlechtriem, 'Article 1' (n 31) 29 [21].

101 Gillette and Walt (n 15) 50, 53; Mowbray (n 86) 145; Marcus G Larson, 'Applying Uniform Sales Law to International Software Transactions: The Use of the *CISG*, Its Shortcomings, and a Comparative Look at How the Proposed *UCC* Article 2B Would Remedy Them' (1997) 5 *Tulane Journal of International and Comparative Law* 445, 454–6. Cf Muñoz (n 15) 293–8, 301; Green and Saidov (n 37) 180.

102 Ingeborg Schwenzer, 'Article 35' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 591, 594 [6]. See also Huber and Mullis (n 15) 130–1; Kröll, 'Article 35' (n 96) 487 [3], 496 [37]; CM Bianca, 'Article 35' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 268, 272 [2.1].

This provision is easily applied to non-software data trade.[103] As explained in Part II(C), contractual terms are necessarily adapted to the transaction at hand, making it commercially reasonable to apply *CISG* article 35(1) to non-software data trade notwithstanding its strict liability basis.[104] Some types of non-software data, including audio and video files, have traditional physical equivalents.[105] Given *CISG* article 35(1)'s routine application to those traditional goods, the application of its standards to their digital counterparts should be without difficulty.[106] Otherwise, the following non-exhaustive list of examples illustrates the suitability of *CISG* article 35(1)'s standards for non-software data trade:

- The 'quantity' standard could include the number of apps transferred, the number of devices that apps are authorised for use on, or the volume of raw data sold. That volume, in turn, might be measured by file size or by the number of data points. The quantity standard's meaning in non-software data cases is therefore flexible and would adapt to the needs of each case. In general, the extent and detail of non-software data would be covered here, as well as its correctness and permissible error rates.[107] Missing data would breach this standard.[108]
- As identified in 'To Boldly Go, Part I', 'quality' can relate to the non-physical features of traditional goods. In the non-software data context, *CISG* article 35(1)'s quality standard might include an app's commercial uses, and the provision of proper instructions for its use.[109]
- Non-software data's 'description' might refer to its 'nature'.[110] For example, media files would need to be delivered in their contractually specified file format.[111]
- Quality and description might both cover compatibility obligations, relating to hardware and operating system environments.[112]
- Packaging requirements, though most obviously relevant in cases involving traditional goods, would be adapted to refer to non-software data's digital structure. This adaptation is described in more detail in relation to *CISG* article 35(2)(d) below.

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103 Hachem, 'Annex' (n 9) 85 [25].
104 Muñoz (n 15) 293.
105 Including, but not limited to, CDs and DVDs.
106 Cf Larson (n 101) 454–6.
107 Hachem, 'Annex' (n 9) 85–6 [25], [27].
108 Ibid 85 [25].
109 Kröll, 'Article 35' (n 96) 493 [27], 499 [51]. See, eg, Bundesgerichtshof [German Federal Court of Justice], VII ZR 309/95, 4 December 1996 [tr Birgit Kurtz and William M Barron] <http://www.cisg-online.org/files/cases/6234/translationFile/260_31876178.pdf>: though the claim in this case, based upon the provision of inadequate instructions for a printing system, failed on account of the buyer's insufficiently detailed notice of non-conformity.
110 Schwenzer, 'Article 35' (n 102) 597 [11].
111 Such contractual specifications are common: Hachem, 'Annex' (n 9) 85 [25]. See also 'Maximising Value from Data' (n 11) 0:13:06–0:13:17.
112 Muñoz (n 15) 294.

2 CISG Article 35(2): The Convention's Default Conformity Regime

CISG article 35(2) 'applies in so far as the contract does not contain any, or contains only insufficient, details of the requirements to be satisfied by the goods for the purposes of Article 35(1)'.[113] According to this provision, goods must be fit for their ordinary purposes,[114] fit for their particular purposes,[115] possess the qualities held out via any sample or model,[116] and be packaged in their usual (or in an adequate) manner.[117] As with *CISG* article 35(1)'s standards, these four 'supplementary' conformity rules[118] are capable of application and adaptation to non-software data trade. This conclusion is particularly significant from a commercial perspective, as *CISG* article 35(2) purports to be a 'codification'[119] that is 'based on the normal expectations of parties' to international sales.[120]

(a) CISG Article 35(2)(a): Fitness for Ordinary Purpose

Pursuant to *CISG* article 35(2)(a), goods must 'primarily, be fit for commercial purposes'.[121] In the abstract, these generally include resale and other purposes that are 'decided by reference to the objective view of a person in the trade sector concerned'.[122] Durable goods are required to 'remain fit for their ordinary purpose for a certain period'.[123]

This conformity standard can be applied to non-software data, as that data's ordinary purpose can be determined based upon its type. Media files, for example, will need to be accessible in a commercial setting via relevant software or apps. Some media files will have additional ordinary purposes. Audio or video recordings of continuing professional development ('CPD') seminars, for example, will need to be recognised for CPD purposes by the relevant profession's accrediting body. The ordinary purpose of an app would be its use in a commercial setting. Raw data, on the other hand, will ordinarily be used for analysis. *CISG* article 35(2)(a) will therefore be breached if raw data is falsified. In practice, it is likely that *CISG* article 35(2)(b)'s particular purpose standard will take priority in the non-software data context, given that businesses will purchase data to serve specific commercial needs.[124] However, *CISG* article 35(2)(a) still remains relevant in at least the contexts described above, and in particular where the requirements for *CISG* article 35(2)(b)'s application are not satisfied. As non-software data is not perishable, and

113 Schwenzer, 'Article 35' (n 102) 599 [13]. See also Bianca, 'Article 35' (n 102) 272 [2.1].
114 *CISG* (n 6) art 35(2)(a).
115 Ibid art 35(2)(b).
116 Ibid art 35(2)(c).
117 Ibid art 35(2)(d).
118 Kröll, 'Article 35' (n 96) 502 [64].
119 Ibid 503 [67].
120 Ibid 503 [66].
121 Schwenzer, 'Article 35' (n 102) 600 [15]. See also Bianca, 'Article 35' (n 102) 274 [2.5.1].
122 Schwenzer, 'Article 35' (n 102) 600–2 [15].
123 Ibid 601–2 [15].
124 Ibid 600 [13].

is instead more akin to durable goods, *CISG* article 35(2)(a) requires that it remain fit for its ordinary purposes for a relatively longer period of time.[125]

To be fit for their ordinary purposes, goods must be 'free from defects normally not expected in such goods'.[126] This principle provides *CISG* article 35(2)(a) with a necessary degree of flexibility in the non-software data context. For example, it is common practice to issue updates for apps (after their initial release) that add functionality, fix bugs, or address security issues.[127] Reasonable app purchasers should not, therefore, normally expect a flawless product upon its initial delivery.[128] On the other hand, some defects may breach *CISG* article 35(2)(a) from the outset, if sufficiently serious: such as the deliberate inclusion of malicious programming or spyware in an app.[129] *CISG* article 35(2)(a)'s flexible standard is informed by the price charged for goods,[130] and their seller's identity.[131] Again using apps as an example, quality expectations do vary in this market according to price point[132] and a developer's reputation.[133] These observations further confirm *CISG* article 35(2)(a)'s suitability in this context.

As with *CISG* article 35(1)'s quality standard, *CISG* article 35(2)(a) may require the provision of instructions for apps and other types of non-software data for which instructions would reasonably be required.[134]

(b) CISG Article 35(2)(b): Fitness for Particular Purpose

CISG article 35(2)(b) requires that goods be fit for a buyer's particular purpose where that purpose was expressly or impliedly made known to the seller, before or at the time of the contract's conclusion, except where the buyer did not rely (or where it was unreasonable for them to rely) upon the seller's skill and judgment.

At first glance, the requirement to *make known* a particular purpose may seem ill-fitting for non-software data transactions. The online purchase of digital music, for example, immediately evokes connotations of a take-it-or-leave-it transaction: no facility permitting the communication of a buyer's purpose exists on systems like the iTunes platform. However, it is important to keep *CISG* article 2(a)'s consumer

125 Muñoz (n 15) 299: in the examination and notice context.

126 Kröll, 'Article 35' (n 96) 504 [71]. See also Bianca, 'Article 35' (n 102) 274 [2.5.1].

127 Spencer Grover, 'Best Practices for Updating Your App on the App Store', *Placeit Blog* (Blog Post, 12 September 2019) <https://blog.placeit.net/app-updates-best-practices/>. See also Green and Saidov (n 37) 178–9.

128 Muñoz (n 15) 293; Green and Saidov (n 37) 179–80. See also Kröll, 'Article 35' (n 96) 505 [75], 506 [78].

129 Wulf (n 18) 172: perhaps also constituting a fundamental breach.

130 Fritz Enderlein and Dietrich Maskow, *International Sales Law: United Nations Convention on Contracts for the International Sale of Goods, Convention on the Limitation Period in the International Sale of Goods* (Oceana Publications, 1992) 144 [8]; Kröll, 'Article 35' (n 96) 507 [86].

131 Kröll, 'Article 35' (n 96) 508 [87].

132 Ryan Matzner, 'How To: Determine the Right Price for Your Mobile App', *Mashable* (Blog Post, 17 August 2011) <https://mashable.com/archive/price-mobile-app>.

133 Evidenced by the capacity for poor quality apps to damage a developer's reputation: Ryan Faas, '10 Mistakes That Can Sink an App, a Mobile Site, and a Company's Reputation', *Cult of Mac* (Blog Post, 1 June 2012) <https://www.cultofmac.com/170828/10-mistakes-that-can-sink-an-app-mobile-site-and-a-companys-reputation/>.

134 Kröll, 'Article 35' (n 96) 514 [108].

contracts exclusion in mind here. *CISG* article 35(2)(b) is only concerned with commercial transactions: a context in which buyers might more readily be able to communicate their particular purposes.[135]

A number of particular purposes might arise in relation to non-software data that are comparable to those arising with respect to physical goods. This is indicative of *CISG* article 35(2)(b)'s suitability for non-software data trade. For example, a machine might be used in unusual climatic conditions,[136] whilst an app might be used within specific (and perhaps even atypical) hardware or operating system environments.[137] Also as with physical goods, a buyer might require apps to have 'a certain operational lifetime':[138] implying the need for developer support throughout. Raw data, on the other hand, might be required for a marketing campaign:[139] such as a soft drink manufacturer seeking data from a social media platform regarding consumer habits in order to apply this data to its marketing strategy. Raw data might alternatively be intended to inform a buyer's development of other commercial or consumer goods.[140] Particular purposes like these might affect the scope and level of detail that non-software data is required to possess.[141] As with *CISG* article 35(2)(a), however, a reasonable understanding of a buyer's particular purpose should take into account routine update practices in the app market.[142]

Some practical problems remain with *CISG* article 35(2)(b)'s application to non-software data. These reflect the limits of its practical operation, rather than its inadequacy for data trade. For example, even though the requirement to make known a particular purpose is 'less restrictive' than a contractual agreement,[143] there may be no opportunity to do so even in commercial contexts. Non-software data might be purchased via completely automated systems, for example.[144] A difficult variation of this scenario, though perhaps one unlikely to arise in practice, might involve a buyer disclosing their particular purpose but only to an automated chatbot. There is no requirement for a seller to have 'actual knowledge' of a particular purpose if the buyer fulfils their task of making it known, though sellers must still be able to 'deduce the particular purpose from the information passed'.[145] The key question here will be whether 'a reasonable person in the position of the seller would have recognised the purpose'.[146] This is doubtful in this chatbot

135 Hachem, 'Annex' (n 9) 86 [30].
136 Schwenzer, 'Article 35' (n 102) 606 [21].
137 Muñoz (n 15) 294–5.
138 Kröll, 'Article 35' (n 96) 517 [124].
139 'The Importance of Branding to Digital Transformation', *The Allen & Overy Podcast* (Allen & Overy, 16 April 2020) 0:16:31–0:17:19 <https://allenovery.podbean.com/e/the-importance-of-branding-to-digital-transformation/> ('Branding').
140 'Maximising Value from Data' (n 11) 0:01:39–0:01:54.
141 Hachem, 'Annex' (n 9) 85 [26].
142 Muñoz (n 15) 293.
143 Schwenzer, 'Article 35' (n 102) 607 [22]. See also Huber and Mullis (n 15) 138; Enderlein and Maskow (n 130) 145 [11].
144 See generally Wulf (n 18) 92–9; United Nations Commission on International Trade Law (n 86) 21 [105], [108].
145 Kröll, 'Article 35' (n 96) 516 [116]–[117].
146 Huber and Mullis (n 15) 138–9.

example. Where a chatbot's automation is obvious to the buyer, the lack of reliance (or lack of reasonable reliance) exceptions may also apply.[147]

Another practical limitation of *CISG* article 35(2)(b)'s application to non-software data trade is the tendency for a buyer's precise specifications to factually nullify their reliance on a seller's skill and judgment. Returning to the soft drink manufacturer example identified above, instead of asking for data relating to consumer habits, the manufacturer might instead seek to purchase data capturing particular aspects of users' social media histories where those users fall within tightly defined demographics. This again poses no problems as a matter of principle. This same limitation applies in relation to the provision of specifications for physical goods.[148]

Finally, with respect to *CISG* article 35(2)(b), consideration must be given to the effect of data protection regulations. Although data protection laws are public law instruments, they have an important area of overlap with the *CISG*: commercial trade in non-software data (particularly personal data as a form of raw data) may breach privacy rights. Where this is the case, is there also a breach of contract? *CISG* articles 35(1), 2(a) and 2(b) collectively provide a solution to this problem, via existing case law addressing non-compliance with public law standards.[149]

In this regard, the famous[150] *New Zealand Mussels Case* explains that a seller is not expected to comply with specialised public law standards in the buyer's country unless one of the following three scenarios applies:

- The seller has been made aware of those standards.
- The standards are the same as those in the seller's country.
- The seller has existing knowledge of the standards as a result of special circumstances.[151]

A seller may also be required to comply with public law standards in its own State, though the Court was not required to definitively decide that point in the *New Zealand Mussels Case*.[152]

Applying these principles to data protection laws and non-software data trade, it can be deduced that:

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147 Kröll, 'Article 35' (n 96) 518 [129]. This might not be the case, however, where a chatbot is particularly sophisticated: see, eg, 'Not Just Doom & Gloom: Technology's Positive Impact on the Retail Sector', *DLA Piper TechLaw Podcast Series* (DLA Piper, 18 December 2018) 0:05:52–0:07:22 <https://soundcloud.com/user-70946062/speaker-announcement-chloe-forster-ruth-hoy-and-gurpreet-durha> in the consumer context.

148 Enderlein and Maskow (n 130) 146 [13]; Schwenzer, 'Article 35' (n 102) 608 [25].

149 See generally Schwenzer, 'Article 35' (n 102) 604–7 [18]–[19], [21]–[22].

150 Nicholas Whittington, 'Comment on Professor Schwenzer's Paper' (2005) 36(4) *Victoria University of Wellington Law Review* 809, 810.

151 *New Zealand Mussels Case*, Bundesgerichtshof [German Federal Court of Justice], VII ZR 159/94, 8 March 1995, 5–6 [20]–[22] [tr Birgit Kurtz] <http://www.cisg-online.org/files/cases/6122/translationFile/144_81006178.pdf>. See also Djakhongir Saidov, '*CISG* Advisory Council Opinion No 19: Standards and Conformity of the Goods under Article 35 *CISG*', *Opinions* (Web Page, 25 November 2018) [5.2] <https://www.cisgac.com/Opinion-no19-standards-and-conformity/>.

152 *New Zealand Mussels Case*, Bundesgerichtshof [German Federal Court of Justice], VII ZR 159/94, 8 March 1995, 6 [22] [tr Birgit Kurtz] <http://www.cisg-online.org/files/cases/6122/translationFile/144_81006178.pdf>.

- *CISG* article 35(2)(a) arguably requires sellers to comply with data privacy standards in their own State.
- *CISG* article 35(2)(b) requires sellers to comply with data privacy regulations in the buyer's State, in each of the three circumstances identified by the *New Zealand Mussels Case*.
- *CISG* article 35(1) will require a seller's compliance with data privacy standards in accordance with the terms of the parties' contract.[153]

Some authorities advocate developing a property law approach to international data protection.[154] The *CISG* is sufficiently flexible to accommodate such a (future) legal development, via *CISG* article 41. Nevertheless, for the time being, *CISG* article 35 provides an appropriate conformity-based solution to this public law data protection problem.

(c) CISG Article 35(2)(c): Conformity with Samples or Models

CISG article 35(2)(c) requires goods to 'possess the qualities of goods which the seller has held out to the buyer as a sample or model'.

In the case of raw data, including personal data and data relating to clinical trials, this standard may be breached if the categories of data included in a sample are not reflected (or are only sporadically included) in the full data set eventually sold.[155]

In addition, this standard has particular relevance to app sales. Vendors commonly provide free versions of their apps, having limited functionality, with buyers being able to buy full versions for a fee.[156] A sample, for the purposes of *CISG* article 35(2)(c), 'is normally taken from an existing quantity',[157] whilst models are supplied for examination 'where the goods themselves are not available'.[158] Models are not necessarily complete representations of the goods to be sold.[159] On the basis of these definitions, free app versions are likely to constitute models vis-a-vis their full versions for the purposes of *CISG* article 35(2)(c). That free apps are (by their very nature) incomplete means that buyers will only be able to rely on their qualities in so far as corresponding paid apps reflect (or do not reflect) those same qualities. *CISG* article 35(2)(c) will have nothing to say about the features of a paid app that are beyond the scope of its free sibling: as models, free apps intend 'to point out only some qualities of the goods'.[160]

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153 Ibid 4 [16].

154 Jeffrey Ritter and Anna Mayer, 'Regulating Data as Property: A New Construct for Moving Forward' (2018) 16(1) *Duke Law and Technology Review* 220, 223; Jacob M Victor, 'The EU General Data Protection Regulation: Toward a Property Regime for Protecting Data Privacy' (2013) 123(2) *Yale Law Journal* 513, 515–16. See also Nadezhda Purtova, 'Property Rights in Personal Data: Learning from the American Discourse' (2009) 25(6) *Computer Law and Security Review* 507, 507–8. Cf Barbara J Evans, 'Much Ado about Data Ownership' (2011) 25(1) *Harvard Journal of Law and Technology* 69, 72–7.

155 Hachem, 'Annex' (n 9) 86 [28].

156 Samantha Cooney, 'Lots of Apps Have Free and Paid Versions: Here's Which Ones Are Worth Your Money', *Business Insider* (online, 19 June 2016) <https://amp.businessinsider.com/free-vs-paid-apps-which-should-you-buy-2016-6>.

157 Enderlein and Maskow (n 130) 146 [16].

158 Schwenzer, 'Article 35' (n 102) 609 [26].

159 Ibid.

160 Bianca, 'Article 35' (n 102) 276 [2.6.2].

CISG article 35(2)(c)'s standard is appropriate in this context, given the commercial purposes underpinning the circulation of free apps. Free apps are intended to provide a 'trial run',[161] enticing customers to pay for an app's full version.[162] Free apps thus fulfil the same commercial purposes as models of traditional goods: they are 'a concrete way for the seller to specify [their] offer'.[163] Confining *CISG* article 35(2)(c)'s operation to a free app's scope is also commercially reasonable. As a matter of principle, buyers should not be entitled to extrapolate too far from the model with which they are provided.[164] This is especially so where models (as is the case with free apps) represent only 'an approximate description of the goods offered'.[165] Textual descriptions and video demonstrations given in relation to each app version, in app stores, will also affect *CISG* article 35(2)(c)'s operation.[166]

CISG article 35(2)(c) is subject to an important limitation: its application requires a holding out of the sample or the model by the seller.[167] It is not enough for a sample or model to 'merely [be] presented on a non-obligatory basis'.[168] In the non-software data context, this means that a free app's mere existence is insufficient to trigger *CISG* article 35(2)(c) liability. A buyer should not be able to point to a free app's circulation, after contracting, when they did not access it and rely upon its representativeness beforehand. Since an app's free version may be used without its full version ever being purchased, and vice versa, distributing a free app should be considered as being without obligation *except* where it is acquired and used first, and where its full version is then purchased and used by the same user within a reasonable period of time.

This analysis is consistent with the proposition that buyers have the burden of proof under *CISG* article 35(2)(c).[169] It thus reflects a reasonable practical limitation on this standard's application in the non-software data context.

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161 Schwenzer, 'Article 35' (n 102) 610 [27].

162 Kröll, 'Article 35' (n 96) 521 [141].

163 Bianca, 'Article 35' (n 102) 276 [2.6.1]. See also Huber and Mullis (n 15) 139; ibid 519 [135].

164 See, eg, Rechtbank van Koophandel Hasselt [Hasselt Commercial Court], AR 05/4177, 19 April 2006 [tr Kristof Cox] <http://www.cisg-online.org/files/cases/7311/translationFile/1389_75441141.pdf>. In this case, a sample of wood from a wooden door 'was too small for the buyer to be entitled to derive from it that there would be no difference in color in the eventual delivery', in circumstances where '[i]t cannot be expected of the seller that it would deliver a complete door as a sample'. See also Landgericht Regensburg [Regensburg District Court], 6 O 107/98, 24 September 1998 [tr Ruth M Janal, Camilla Baasch Andersen (ed)] <http://www.cisg-online.org/files/cases/6482/translationFile/514_46240228.pdf>. Here, the provision of a 10cm x 10cm fabric sample did not give the buyer an entitlement to expect that fabric would be able to be cut in a particular economical way while making garments, where the fabric otherwise conformed to that sample.

165 Bianca, 'Article 35' (n 102) 276 [2.6.3]. See also Kröll, 'Article 35' (n 96) 520 [137].

166 Enderlein and Maskow (n 130) 147 [16]; Schwenzer, 'Article 35' (n 102) 609–10 [27]; Bianca, 'Article 35' (n 102) 276 [2.6.2].

167 Huber and Mullis (n 15) 140.

168 Kröll, 'Article 35' (n 96) 520 [135]. See also Schwenzer, 'Article 35' (n 102) 610 [28].

169 Rechtbank van Koophandel Hasselt [Hasselt Commercial Court], AR 05/4177, 19 April 2006 [tr Kristof Cox] <http://www.cisg-online.org/files/cases/7311/translationFile/1389_75441141.pdf>.

(d) CISG Article 35(2)(d): Packaging Requirements

CISG article 35(2)(d) contains the *CISG*'s fourth and final default conformity standard. According to this provision, goods must be packaged in their usual manner. This is determined 'according to the usage applicable in the particular trade branch', with regard being had to 'the purpose of packaging, ie the appropriate protection of the goods during transport'.[170]

First impressions might suggest that packaging obligations can only ever be relevant in cases involving physical goods. After all, it is 'the peculiarities of international transactions, often requiring long distance transportation crossing several borders, [that make] packaging of the goods … of considerable importance'.[171] Hachem's *CISG* data analysis refers, for example, to physical data carriers in this regard.[172] Still, *CISG* article 35(2)(d)'s standard is flexible, and even packaging obligations relating to traditional goods can create difficulties where 'a new kind of product' is involved.[173]

This standard can be adapted to non-software data trade without impermissibly stretching *CISG* article 35(2)(d)'s text. This adaptation can be achieved via a literal reading of the words 'contained or' as extending the following term 'packaged', which is an interpretative methodology supported by *CISG* article 7(1).[174] Data must be subject to some kind of digital containment (ie, assembled according to some kind of digital structure) for the purposes of its transmission. *CISG* article 35(2)(d)'s packaging standard can be applied to this digital structure. Since *CISG* article 35(2)(d)'s application is affected by the destination of goods,[175] its adaptation to non-software data trade should also take into account whether the volumes of data being delivered in accordance with a particular digital structure are appropriate given the Internet infrastructure existing at the point of receipt.

The legitimacy of *CISG* article 35(2)(d)'s application to non-software data's digital structure is confirmed by the relationship of its obligations to the parties' delivery agreement,[176] and their dependence upon what is usual for the goods and industry concerned.[177] Assuming that non-software data is being transmitted electronically, it cannot possibly be contained or packaged in any other way.

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170 Schwenzer, 'Article 35' (n 102) 611 [31]. See also Huber and Mullis (n 15) 141–2; Kröll, 'Article 35' (n 96) 522 [145].

171 Kröll, 'Article 35' (n 96) 495 [34].

172 Hachem, 'Annex' (n 9) 86 [29].

173 Bianca, 'Article 35' (n 102) 277 [2.7.3].

174 Ingeborg Schwenzer and Pascal Hachem, 'Article 7' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 119, 129 [21]; Viscasillas (n 27) 127 [37]. See also Sieg Eiselen, 'Literal Interpretation: The Meaning of the Words' in André Janssen and Olaf Meyer (eds), *CISG Methodology* (Sellier European Law Publishers, 2009) 61, 74–7, 88–9. See, eg, *MCC-Marble Ceramic Center, Inc v Ceramica Nuova D'agostino, SpA*, 144 F 3d 1384, 1387, 1391 (11th Cir, 1998): referring (on two separate occasions) to the *CISG*'s 'plain language'.

175 Kröll, 'Article 35' (n 96) 523 [149].

176 Enderlein and Maskow (n 130) 143 [6]; Bianca, 'Article 35' (n 102) 276–7 [2.7.1].

177 Enderlein and Maskow (n 130) 147 [17]; Kröll, 'Article 35' (n 96) 522 [145]; Bianca, 'Article 35' (n 102) 277 [2.7.2].

As explained in Part II(E)(1) above, *CISG* article 35(1) also refers to packaging. Where specific structural obligations for non-software data are set out in the terms of the contract, it is *CISG* article 35(1) (rather than *CISG* article 35(2)(d)) that provides for their enforcement.[178]

3 CISG Article 35(3): The Safe Harbour

CISG article 35(3) is the core conformity provision's final component. It provides a safe harbour from liability under *CISG* article 35(2) (only)[179] where 'the buyer knew or could not have been unaware of [the] lack of conformity' at the time of contracting.

This liability exemption is easily applied in the non-software data context, as its underlying policies remain just as relevant as in cases involving traditional goods trade.[180] A buyer's knowledge of data's non-conformity (according to *CISG* article 35(2)'s default standards) normatively justifies depriving it of protection: 'the buyer who knows or ought to know what kind of goods the seller will deliver, cannot ask for goods of better qualities and condition'.[181] On the other hand, even where *contractual* non-conformity is known, a seller should not be able to escape liability under *CISG* article 35(1) for breaching their contract's actually agreed upon terms.[182]

4 CISG Articles 25 and 82(1): The Definition of Fundamental Breach, and the Obligation to Effect Restitution of the Goods Following Avoidance

Though they are not amongst the original 'Muñoz provisions', it is useful to consider *CISG* article 25's definition of fundamental breach as well as *CISG* article 82(1)'s obligation to effect restitution of the goods following avoidance, alongside *CISG* article 35's conformity rules. This is because fundamental breaches of a seller's conformity obligations sit amongst the circumstances justifying a buyer's avoidance of the contract.[183]

Starting with fundamental breach, some practical issues may arise in applying *CISG* article 25's definition of this concept to non-software data trade.[184] These relate to avoidance's status as a remedy of last resort,[185] with a high threshold for

178 Kröll, 'Article 35' (n 96) 522 [145].
179 Huber and Mullis (n 15) 142; Schwenzer, 'Article 35' (n 102) 614–15 [40]–[41]; ibid 498 [48], 524 [158]; Bianca, 'Article 35' (n 102) 279–80 [2.9.2]. Cf Enderlein and Maskow (n 130) 147–8 [19]; ibid 525 [160]–[161].
180 Cf Lyria Bennett Moses, 'Adapting the Law to Technological Change: A Comparison of Common Law and Legislation' (2003) 26(2) *University of New South Wales Law Journal* 394, 398, 411.
181 Bianca, 'Article 35' (n 102) 278 [2.8.1]. See also Kröll, 'Article 35' (n 96) 524 [155].
182 Kröll, 'Article 35' (n 96) 524–5 [158]–[159]; Bianca, 'Article 35' (n 102) 279–80 [2.9.2].
183 *CISG* (n 6) art 49(1)(a).
184 Cf Hachem, 'Annex' (n 9) 88 [36], [38].
185 Ulrich Magnus, 'The Remedy of Avoidance of Contract under *CISG*: General Remarks and Special Cases' (2005) 25(1) *Journal of Law and Commerce* 423, 424.

activation, given the time and expense usually involved in unwinding international sales contracts.[186]

The high threshold required for avoidance based upon a fundamental breach is potentially problematic in the non-software data context as a seller's ability to update some types of data (including apps) means that damages will often be an adequate remedy.[187] While avoidance's status as a remedy of last resort does not imply that other remedies must be resorted to first, it does emphasise that avoidance rights are 'granted reluctantly' under the *CISG*.[188] For this reason, a buyer's practical right to avoid on the basis of non-conformity is probably narrowed where non-software data is updatable. This is consistent with the *CISG* Advisory Council's view that a fundamental breach does not occur where a seller can remedy a non-conformity 'without causing unreasonable delay or inconvenience'.[189]

Parties to *CISG* contracts have the ability to contractually specify the conformity breaches that will justify avoidance.[190] This may be recommended in the non-software data context.[191] This practical recommendation, however, does not demonstrate that *CISG* article 25 is unsuitable for application to data trade. In this regard, non-software data contracts are not unlike commodity sales.[192] The practical attractiveness of the *CISG*'s application to commodity contracts remains contentious,[193] although there is no question as to the *CISG*'s applicability as a matter of principle.[194]

The high threshold required for fundamental breach based avoidance may also be problematic where inexperienced data buyers find it difficult to determine

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186 Andrea Björklund, 'Article 25' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 337, 338 [2]; Franco Ferrari, 'Fundamental Breach of Contract under the *UN Sales Convention*: 25 Years of Article 25 *CISG*' (2006) 25(2) *Journal of Law and Commerce* 489, 490–1; ibid 423–5.

187 Eggen (n 15) 233. Cf Hachem, 'Annex' (n 9) 88 [39].

188 Magnus (n 185) 424–5.

189 Ingeborg Schwenzer, '*CISG* Advisory Council Opinion No 5: The Buyer's Right to Avoid the Contract in Case of Non-conforming Goods or Documents' in Ingeborg Schwenzer (ed), *The CISG Advisory Council Opinions* (Eleven International Publishing, 2017) 101, 109 [4.4].

190 Ulrich G Schroeter, 'Article 25' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 416, 442 [44].

191 Eggen (n 15) 233.

192 Morgan Corley, 'The Need for an International Convention on Data Privacy: Taking a Cue from the *CISG*' (2016) 41(2) *Brooklyn Journal of International Law* 721, 721–2. See, eg, Benjamin K Leisinger, *Fundamental Breach Considering Non-conformity of the Goods* (Sellier European Law Publishers, 2007) 133–5; Michael Bridge, 'Avoidance for Fundamental Breach of Contract under the *UN Convention on the International Sale of Goods*' (2010) 59(4) *International and Comparative Law Quarterly* 911, 934–5, 940.

193 Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas, 'Introduction to the *CISG*' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 1, 14–15 [45]–[46]. Reflected, for example, in the tendency of standard form commodity contracts to exclude the *CISG*: Benjamin Hayward, Bruno Zeller and Camilla Baasch Andersen, 'The *CISG* and the United Kingdom: Exploring Coherency and Private International Law' (2018) 67(3) *International and Comparative Law Quarterly* 607, 621; Katrina Winsor, 'The Applicability of the *CISG* to Govern Sales of Commodity Type Goods' (2010) 14(1) *Vindobona Journal of International Commercial Law and Arbitration* 83, 83–5; Michael Bridge, 'A Law for International Sale of Goods' (2007) 37(1) *Hong Kong Law Journal* 17, 39–40.

194 Leisinger (n 192) 121–2.

whether a fundamental breach has occurred.[195] The stakes are high: unjustified avoidance may itself constitute a fundamental breach,[196] and avoidance based upon the *nachfrist* procedure is unavailable to buyers where breaches involve non-conformity.[197] Nevertheless, unwinding non-software data contracts might not involve the same time and costs that are associated with contracts for traditional goods. The *CISG*'s policy of keeping contracts on foot[198] is therefore less relevant in this context. *CISG* article 7(1), if read alongside *Vienna Convention on the Law of Treaties* article 31(1),[199] supports referring to this purpose (and its diminished relevance) in order to soften the strictness of the fundamental breach threshold in non-software data cases.[200]

On the other hand, a seller's ability to transfer non-software data via duplication raises some practical difficulties concerning *CISG* article 82(1)'s obligation to effect restitution following avoidance. Pursuant to this obligation, following avoidance, buyers may be called upon to prove that non-software data is no longer in their possession.[201] Deleting the data originally sold is probably the best way to effect the 'reverse sale of the goods'[202] contemplated by this restitutionary process.[203] Deletion is at least analogous to the concept of partial restitution,[204] as well as redelivery of the goods at the buyer's premises for the purpose of avoiding economic waste: this purpose being a general principle of the *CISG*.[205]

All of the matters addressed in this Part reflect practical difficulties that may or may not arise regarding fundamental breach and restitution in any particular case. These difficulties ultimately arise out of issues of fact. While they may be challenging to resolve in particular cases, these difficulties do not suggest that it is inappropriate (as a matter of law) to apply *CISG* articles 25 and 82(1) to non-software data trade.

F Examination and Notice: *CISG* Articles 38–9

CISG articles 38–9 set out the *CISG*'s examination and notice rules. Collectively, these provisions determine when buyers retain their rights relating to non-conformity.[206] Assessing their fit with non-software data trade is once

195 Eggen (n 15) 234.
196 Markus Müller-Chen, 'Article 49' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 775, 797 [46].
197 *CISG* (n 6) art 49(1)(b); ibid 783 [15].
198 Björklund (n 186) 338 [2]; Ferrari (n 186) 490–1.
199 *Vienna Convention on the Law of Treaties*, opened for signature 23 May 1969, 1155 UNTS 331 (entered into force 27 January 1980).
200 Eiselen (n 174) 62–3. Cf Schwenzer and Hachem, 'Article 7' (n 174) 130 [23].
201 Hachem, 'Annex' (n 9) 88 [38].
202 Michael Bridge, '*CISG* Advisory Council Opinion No 9: Consequences of Avoidance of the Contract' in Ingeborg Schwenzer (ed), *The CISG Advisory Council Opinions* (Eleven International Publishing, 2017) 209, 216 [3.6] ('Opinion 9').
203 Wulf (n 18) 171.
204 Bridge, 'Opinion 9' (n 202) 218–19 [3.9].
205 Ibid 220 [3.12].
206 Enderlein and Maskow (n 130) 154 [1].

again essential. *CISG* articles 38–9 sit 'among the most litigated provisions in the *Convention*',[207] and are therefore highly relevant in legal practice.[208]

Non-software data cannot be visually inspected in the same way that traditional goods (like wheat or merchandise) can. Data's capacity for examination also differs from software, where the type of non-software data involved (including media files and raw data) is non-functional. These observations pose challenges to *CISG* articles 38–9's application in the non-software data context. Nevertheless, those challenges can be overcome. The *CISG*'s examination and notice rules have already been described as 'particularly well suited' for software's 'specificities'.[209] As will be seen in this Part, they are also flexible enough to accommodate non-software data trade.

1 CISG Article 38: Examination of the Goods

The method of examination required by *CISG* article 38(1) depends upon the nature of the goods, as well as all other relevant circumstances.[210] Whether or not non-software data is itself functional, such data can be examined in the course of its use. Analogies can be drawn with the examination of gas contained in canisters[211] and machinery.[212] So, for example, apps can be examined when run; media files can be examined when accessed via software or apps; and raw data (including personal data) can be examined when it is analysed using software or apps. Where large quantities of raw data are sold, conducting spot checks across the data set might be a valid examination methodology.[213]

Where complex goods are involved, a 'complex technological analysis' is not required: the method of examination used under *CISG* article 38(1) need only be 'reasonable'.[214] This further supports the view that non-software data can be examined in the course of its use. It also supports the view that buyers are not expected to 'invest unreasonable resources and time in trying to find security bugs or vulnerabilities' in non-software data.[215] Non-software data's factual complexity (and its potentially sophisticated or technical nature) can also be accommodated by taking a relatively liberal approach to *CISG* article 38(1)'s 'as short a period

207 Huber and Mullis (n 15) 147.
208 Kröll, 'Article 39' (n 43) 587 [1].
209 Muñoz (n 15) 298.
210 Oberster Gerichtshof [Austrian Supreme Court of Justice], 1 Ob 223/99x, 27 August 1999 <https://iicl.law.pace.edu/cisg/case/austria-ogh-oberster-gerichtshof-supreme-court-austrian-case-citations-do-not-generally-74>; Huber and Mullis (n 15) 151; Enderlein and Maskow (n 130) 155 [1]; Schwenzer, 'Article 38' (n 43) 641–2 [13]; CM Bianca, 'Article 38' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 295, 298 [2.3]; Eric Bergsten, '*CISG* Advisory Council Opinion No 2: Examination of the Goods and Notice of Non-conformity' in Ingeborg Schwenzer (ed), *The CISG Advisory Council Opinions* (Eleven International Publishing, 2017) 39, 40 ('Opinion 2'). Note that free registration is required to access case law on the Albert H Kritzer *CISG* Database.
211 Enderlein and Maskow (n 130) 156 [3].
212 Schwenzer, 'Article 38' (n 43) 643–4 [14]; Muñoz (n 15) 299.
213 Huber and Mullis (n 15) 151; Enderlein and Maskow (n 130) 157 [6]; Schwenzer, 'Article 38' (n 43) 642–3 [14]; Kröll, 'Article 38' (n 43) 561 [36], [39]; Bianca, 'Article 38' (n 210) 298 [2.3]–[2.4].
214 Enderlein and Maskow (n 130) 155 [1]; Bianca, 'Article 38' (n 210) 298 [2.3].
215 Muñoz (n 15) 299.

as is practicable' examination timeframe.[216] This is particularly so given that data is more akin to durable (rather than perishable) goods.[217] As with the method of examination, *CISG* article 38(1)'s examination timeframe depends upon all of the circumstances of the case.[218]

2 CISG Article 39: Giving Notice of Non-conformity

Once examination has occurred, the very same communication technologies that underpin non-software trade facilitate the relatively prompt notice which *CISG* article 39(1) requires.[219] In the software context, Muñoz advocates allowing 'for more than one notice or exchange of communications, whereby the seller inquires further about the specific problems and software operations, allowing the buyer to substantiate the lack of conformity'.[220] This would be a sensible solution in the non-software data context too. It is not only consistent with the *CISG*'s freedom of form principle, and thus an available solution via *CISG* article 7(2)'s gap-filling rules,[221] but is also consistent with a good faith interpretation of *CISG* article 39(1)[222] when approached from the perspective of contemporary business expectations.[223]

In part, *CISG* article 39(1)'s notice rule is intended to facilitate sellers being able to provide an appropriate remedy for the non-conformities that a buyer identifies.[224] This purpose has a particularly practical application in the app market, where updates can be issued which add functionality, fix bugs, or address security vulnerabilities. This is not to say that buyers need technical expertise in order to comply with *CISG* article 39(1)'s notice requirements in the non-software data context. As to the notice's content, 'where the goods … do not work and the reason for this is not obvious, it is sufficient that the buyer give an indication of the symptoms without having to provide details as to the cause'.[225] It is still important, however, that a notice be a genuine notice of non-conformity, and not a mere request for the seller's assistance in addressing problems that a buyer has identified.[226] Buyers of non-software data are still able to give notice 'in technical

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216 Huber and Mullis (n 15) 155; Enderlein and Maskow (n 130) 155 [2]; Schwenzer, 'Article 38' (n 43) 646 [17]; Bianca, 'Article 38' (n 210) 299 [2.5].

217 Muñoz (n 15) 299.

218 Bergsten, 'Opinion 2' (n 210) 40. See also Kröll, 'Article 38' (n 43) 570 [80].

219 Enderlein and Maskow (n 130) 159–60 [3].

220 Muñoz (n 15) 300.

221 Ibid.

222 *CISG* (n 6) art 7(1).

223 Schwenzer, 'Article 39' (n 43) 656 [7].

224 Huber and Mullis (n 15) 149, 157; Enderlein and Maskow (n 130) 160 [5]; Schwenzer, 'Article 38' (n 43) 638 [4]; ibid 654–5 [6]; Kröll, 'Article 38' (n 43) 553–4 [4]–[5]; Kröll, 'Article 39' (n 43) 589 [8], 595 [33]; K Sono, 'Article 39' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 303, 309 [2.3]; Muñoz (n 15) 298, 300. On the seller's ability to remedy see generally Ingeborg Schwenzer and Ilka H Beimel, '*CISG* Advisory Council Opinion No 21: Delivery of Substitute Goods and Repair under the *CISG*', *Opinions* (Web Page, 3–4 February 2020) <http://cisgac.com/opinion-no-21-/Delivery%20of%20Substitute%20Goods%20and%20Repair%20under%20the%20CISG/>.

225 Huber and Mullis (n 15) 158. See also Schwenzer, 'Article 39' (n 43) 657 [8]; Kröll, 'Article 39' (n 43) 596 [35], 597 [39]; Muñoz (n 15) 300.

226 Landgericht München I [Munich I District Court], 8 HKO 24667/93, 8 February 1995 <http://www.cisg-online.org/files/cases/6177/abstractsFile/203_44704976.pdf>.

language', however, if they have the relevant expertise or have had similar past experiences.[227]

3 Contractual Provisions Impacting upon Examination and Notice

As explained in Part II(C), contractual agreements displacing specific *CISG* provisions (including the *CISG*'s examination and notice provisions) will be adapted to the transaction at hand. They will therefore necessarily be appropriate solutions for the cases in which they appear. As a result, the *CISG*'s default nature reinforces its compatibility with non-software data trade.

Contractual obligations requiring a seller to support non-software data for a particular period of time may raise additional issues, however, concerning the point in time at which notice of non-conformity must be given, as well as the contractually specified duration's interaction with *CISG* article 39(2)'s two year long stop period. These matters are equivalent to those already arising with respect to traditional goods and periods of guarantee.[228] Addressing these issues may be factually difficult, as is the case with traditional goods. As a matter of law, however, their resolution merely requires careful interpretation and application of the *CISG*'s examination and notice rules (and interpretation of the contract) on a case by case basis.

G Third Party IP Claims: *CISG* Article 42

Pursuant to *CISG* article 42(1), sellers are obliged to deliver goods that are 'free from any right or claim of a third party based on industrial property or other intellectual property, of which at the time of the conclusion of the contract the seller knew or could not have been unaware'. This obligation applies in addition to *CISG* article 35's conformity requirements.[229] The IP referred to in *CISG* article 42(1) includes copyright.[230] Copyright will typically exist, but will not be transferred, where non-software data is sold.[231] As explained in 'To Boldly Go, Part I', this follows from licensing being common practice in the non-software data market. That counterpart article analysed copyright issues as they relate to *CISG* article 1(1)'s sale criterion. Here, a seller's (or other entity's) retention of copyright is once again relevant in the context of the parties' obligations.

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227 Muñoz (n 15) 300.

228 Huber and Mullis (n 15) 162; Schwenzer, 'Article 39' (n 43) 667–8 [28]–[29]; Kröll, 'Article 39' (n 43) 609 [97]–[98]; Sono (n 224) 312–13 [3.3]–[3.5].

229 Trakman, Walters and Zeller, 'Trade in Personal Data' (n 10) 257; Dushica Atanasovska, 'L'applicabilità della *Convenzione di Vienna sulla Vendita Internazionale di Beni* alle Transazioni aventi ad Oggetto Software: Vendita o Licenza?' [The Applicability of the *CISG* to Transactions Involving Software: Sale or License?] (2016) 5(2) *Ricerche Giuridiche* 321, 332.

230 Huber and Mullis (n 15) 174; Enderlein and Maskow (n 130) 168 [3]; Ingeborg Schwenzer, 'Article 42' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 692, 694 [4]; Stefan Kröll, 'Article 42' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 637, 642 [13].

231 Cf Hachem, 'Annex' (n 9) 87 [33], [35].

In the software context, where these same licensing considerations apply, parties are treated as derogating from *CISG* article 42 via their *CISG* article 6 party autonomy rights.[232] This analysis can be applied to non-software data trade. In addition, given that licensing is common in both of these markets, *CISG* article 42(2)(a)'s proviso (setting out an exception to this obligation where 'the buyer knew or could not have been unaware of the right or claim') might be satisfied in any event.[233]

In relation to raw data, additional considerations arise from recent analysis arguing that data subjects should hold IP rights in their own personal data.[234] The IP status of personal data is both emerging and contested,[235] but in any event, is able to be accommodated by *CISG* article 42. In particular, where data subjects provide consent for the downstream use of their personal data,[236] there would be a nullification of the 'right or claim' referred to in *CISG* article 42 that would otherwise (according to this proposal) exist.

Just as copyright issues do not disqualify transactions from constituting *CISG* article 1(1) sales, those same issues also do not pose an obstacle to the application of *CISG* article 42's obligation concerning third party IP claims.

H Passing Risk: *CISG* Articles 66–7

Like many of the *CISG*'s other provisions, *CISG* articles 66–70 (addressing the passing of risk) 'are tailored to the handling of tangible objects'.[237] Views diverge as to whether they *only* apply to traditional goods,[238] or whether these provisions are in fact more flexible.[239] In 2005, Schlechtriem noted that this particular aspect of the *CISG*'s risk provisions might make the *CISG* 'ill suited' to software transactions, but ultimately argued that the *CISG*'s 'core provisions on rights and remedies can [still] be applied'.[240] In this Part, I address *CISG* articles 66–7's potential application in the non-software data context. As with all of the 'Muñoz provisions' that I address across Part II, reconciling the *CISG*'s risk rules with non-software data trade is an exercise in interpretation.[241]

Though it is *CISG* articles 66–70 that address risk, I focus on *CISG* articles 66–7 in particular here. These are the provisions implicated in Muñoz's recent software analysis.[242] *CISG* article 66 is the *CISG*'s basic risk rule, applicable in all

232 Muñoz (n 15) 287. But see Schwenzer, 'Article 42' (n 230) 704 [26].
233 Atanasovska (n 229) 332; Green and Saidov (n 37) 177; Larson (n 101) 463. See also Hachem, 'Annex' (n 9) 87 [34].
234 Leon Trakman, Robert Walters and Bruno Zeller, 'Is Privacy and Personal Data Set to Become the New Intellectual Property?' (2019) 50(8) *International Review of Intellectual Property and Competition Law* 937, 953, 966–8.
235 Ibid 962, 966.
236 Ibid 962–3.
237 Schlechtriem, 'Article 1' (n 31) 29–30 [21]. See also Hachem, 'Annex' (n 9) 83 [18].
238 Gillette and Walt (n 15) 53.
239 Muñoz (n 15) 287.
240 Schlechtriem, 'Article 1' (n 31) 30 [21].
241 Muñoz (n 15) 287–8.
242 Muñoz's discussion of risk initially refers to *CISG* articles 66–77, though this appears to be in error: this range of provisions also includes anticipatory breach, instalment contracts, and damages. Muñoz's detailed analysis addresses *CISG* article 67(2) only. See ibid 287–9.

cases, whilst *CISG* article 67 addresses the time that risk passes under contracts involving carriage: a category of case which Part II(D) established as including non-software data trade. *CISG* article 68 applies to goods sold in transit, and *CISG* article 69 applies to cases not falling within *CISG* articles 67–8: neither are relevant to this article's analysis.[243] *CISG* article 70, clarifying the relationship between fundamental breach remedies and the *CISG*'s risk provisions, is also irrelevant for present purposes. My conclusion, that the *CISG*'s risk provisions can accommodate non-software data trade, is important for this article's analysis as 'risk is central to the relationship between the two parties in a sale of goods'.[244]

1 CISG Article 66: The Effect of Risk Passing

CISG article 66 regulates 'price risk', rather than risk in its more 'general senses': that is, 'the risk of having to bear the cost of damage to the goods, or loss thereof because the buyer remains obligated to pay the purchase price, where that loss or damage has happened through no fault of either party'.[245] One of the paradigm examples of a risk event, where goods are 'lost at sea due to an unpredictable storm',[246] emphasises the concept's historical connection with physical goods.[247]

Still, *CISG* article 66's underlying principle remains sound in the digital environment. Buyers must pay for goods where loss or damage occurs after risk passes, and where that loss or damage is not the seller's fault. This is because, as is the case with traditional goods, the subject-matter of non-software data contracts needs to be transferred across time and space: even if that transfer is much faster than internationally transporting physical goods. The potential therefore remains for non-software data to be lost or damaged in transit, regardless of its intangibility.[248]

Whilst *CISG* article 66's underlying principle remains relevant in the non-software data context, the factual circumstances that might give rise to a risk event will differ to those encountered with respect to physical goods. Non-software data is not susceptible to being lost or damaged on the high seas. It may, however, be affected by viruses; or it may be corrupted as a result of power outages, the impact of natural disasters upon Internet infrastructure, or for other reasons.[249]

As a practical matter, analysis of the *CISG*'s basic risk rule needs to keep in mind the fact that non-software data is infinitely reproducible: subject to any contractual terms which might affect the seller's own retention of the data that they

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243 Cf Hachem, 'Annex' (n 9) 85 [22]: applying *CISG* article 69, based upon a different view as to how the *CISG*'s delivery provisions apply in the non-software data context.

244 Johan Erauw, 'Article 66' in Stefan Kröll, Loukas Mistelis and Pilar Perales Viscasillas (eds), *UN Convention on Contracts for the International Sale of Goods (CISG): A Commentary* (CH Beck, 2nd ed, 2018) 850, 851 [3].

245 Schwenzer, Hachem and Kee (n 27) 479 [38.01].

246 Ibid.

247 See also Pascal Hachem, 'Article 66' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 958, 959 [5]; Erauw, 'Article 66' (n 244) 855 [29].

248 Cf Green, 'Sales Law' (n 12) 82.

249 Consolidated Technologies, '10 Common Causes of Data Loss', *Consolidated Technologies Blog* (Blog Post, 17 February 2021) <https://consoltech.com/blog/10-common-causes-of-data-loss/>. See also *Quoine Pte Ltd v B2C2 Ltd* [2020] 2 SLR 20, 90 [196] (Mance IJ); Hachem, 'Annex' (n 9) 84 [22].

have sold. As explained in 'To Boldly Go, Part I', data's reproducibility does not disqualify the *CISG*'s application. For the purposes of the *CISG*'s risk provisions, however, it does mean that another copy of lost or damaged data might easily be provided following a risk event.[250] Applying the *CISG*'s risk provisions in these circumstances may therefore come down, in a practical sense, to identifying who bears the costs of re-providing that data.[251]

2 CISG Article 67: The Time After Which Risk Passes

CISG article 67 sets out when risk passes in cases involving the carriage of goods. Part II(D) established that non-software data contracts do involve delivery via carriage, given the nature of the Internet's data routing system. This conclusion, and the nature of that data routing system, directly impact identification of the relevant risk-timing rule under the *CISG*.

Though *CISG* article 67(1) provides that risk generally passes 'when the goods are handed over to the first carrier for transmission to the buyer in accordance with the contract of sale',[252] Muñoz argues that *CISG* article 67(2) is instead relevant in the software context: 'the architecture of the Internet and similar networks makes it impossible for the buyer to identify the full software purchased while it is carried through the routing system'.[253] This follows from the fact that 'data bytes travelling across the Internet break up into packets, and these do not necessarily have to follow the same route – they may travel from one different computer and server to another until they reach their destination'.[254] Pursuant to *CISG* article 67(2), risk does not pass 'until the goods are clearly identified to the contract, whether by markings on the goods, by shipping documents, by notice given to the buyer or otherwise'.

CISG article 67(2) seeks to prevent sellers 'abusing' goods' lack of identification to a contract 'in order to put the blame for losses or damages on a certain buyer'.[255] The word 'otherwise', in the view of Muñoz, prevents risk passing in software 'until all software sub-packets can be identified to the contract at its arrival to the server under the buyer's control'.[256] The potential abuses that *CISG* article 67(2) seeks to avoid do not arise in the software context, or in cases involving non-software data, as software or data will be addressed to a particular buyer even if it isn't identifiable (as a whole) during its transmission. Nevertheless, the reading of *CISG* article 67(2) that Muñoz advocates is consistent with the principle that

250 Hachem, 'Annex' (n 9) 84 [21].
251 Ibid 85 [23].
252 Or, where the seller is required to hand the goods over to a carrier at a particular place, 'the risk does not pass to the buyer until the goods are handed over to the carrier at that place': *CISG* (n 6) art 67(1).
253 Muñoz (n 15) 289.
254 Ibid 288–9. See also de Zwart (n 76) 309.
255 Enderlein and Maskow (n 130) 268 [9]. See also Nicholas (n 46) 494 [2.7].
256 Muñoz (n 15) 289.

identifying goods to the contract depends upon the circumstances of each case,[257] and it is also consistent with *CISG* article 67(2)'s flexible reputation.[258]

The same Internet routing mechanisms facilitating the electronic carriage of software also govern the transmission of non-software data. *CISG* article 67(2) should therefore also apply in non-software data cases. This conclusion is supported by the fact that data buyers, unlike buyers of traditional goods, are not necessarily in a better position than sellers to assess damage that has occurred during carriage.[259] On the other hand, it is the buyer who should bear the risk of 'problems in reaching [data] already in its server … due to internal problems in the network system'.[260] Applying *CISG* article 67(2), in the way advocated here, generates this result. Part II(D) noted, with reference to *CISG* article 33, that sellers are not responsible for delays in data's transmission (that are outside of their control) where technical issues arise after delivery has occurred. Pursuant to *CISG* article 67(2), however, they remain liable for loss or damage to non-software data that arises up until the time that data is reassembled at the buyer's server.

I Liability Exemptions: *CISG* Articles 79–80

Muñoz engages with *CISG* articles 79–80 only to a limited extent in the software context. *CISG* article 79, Muñoz suggests, may provide relief for sellers where software conforms at the time of contracting but becomes non-conforming at a later stage 'due to different circumstances'.[261] A seller is not relieved of its obligations, however, where 'foreseeable technology changes, which can be overcome, impair the agreed function or software capacity'.[262] As Muñoz points out, it is only where the specific requirements of *CISG* article 79 (force majeure events) or *CISG* article 80 (buyer's contributory fault) are satisfied that sellers will be released from damages or full liability, respectively.[263] In both of these cases, those requirements are not made out where foreseeable technology changes occur that are able to be overcome.[264]

In the software context, *CISG* articles 79–80 merely confirm that a seller's liability for non-conformity is not always strict. Those provisions are capable of fulfilling that same function with respect to non-software data trade. *CISG* article 79's 'narrow' operation will limit its 'practical importance' in non-software data

257 Pascal Hachem, 'Introduction to Articles 66–70' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 950, 955 [19].

258 Erauw, 'Article 67' (n 46) 864 [19].

259 Hachem, 'Article 67' (n 46) 969 [5]; Nicholas (n 46) 494 [3.1].

260 Muñoz (n 15) 289.

261 Ibid 297. Cf Alejandro M Garro, '*CISG* Advisory Council Opinion No 7: Exemption of Liability for Damages under Article 79 of the *CISG*' in Ingeborg Schwenzer (ed), *The CISG Advisory Council Opinions* (Eleven International Publishing, 2017) 167, 175 [13], 186–7 [37]–[39] ('Opinion 7').

262 Muñoz (n 15) 297–8. See also Edgardo Muñoz, '*CISG* Advisory Council Opinion No 20: Hardship under the *CISG*', *Opinions* (Web Page, 2–5 February 2020) [4] <http://cisgac.com/opinion-no20-hardship-under-the-cisg/> ('Opinion 20').

263 Muñoz (n 15) 298.

264 See generally Muñoz, 'Opinion 20' (n 262).

cases, as is already the case with respect to traditional goods.[265] Meanwhile, *CISG* article 80's flexible theory of contributory fault ensures its applicability to non-software data cases. It has been suggested, for example, that an 'infinite number' of fact patterns are capable of falling within *CISG* article 80's scope.[266]

J Interim Summary, and Matters Remaining Ripe for Further Study

This Part has demonstrated that all of the 'Muñoz provisions' are capable of being applied and adapted to non-software data trade. As a result, non-software data does constitute goods for the purposes of *CISG* article 1(1). Taken alongside my analysis previously undertaken in 'To Boldly Go, Part I', this conclusion confirms the *CISG*'s capacity to regulate non-software data trade.

This Part has addressed a range of key *CISG* provisions. Nevertheless, important parts of the *CISG* remain ripe for further study, in order to assess their own compatibility with non-software data trade. *CISG* article 30 is one example. This provision, referred to briefly in Part II(D), requires sellers (amongst other things) to 'transfer the property in the goods'. There are widely diverging views about this provision's digital operation amongst existing scholarly analyses. Eggen argues that contracts for digital goods implicate an analogous duty, requiring passage of the power of disposal, given that no property can be transferred.[267] Green and Saidov suggest that this issue is dealt with via either *CISG* article 42 or *CISG* article 6,[268] while Schmitt similarly argues that the parties' agreement prevails.[269] Larson finds a solution based on *CISG* article 41 instead.[270] On the other hand, Gillette and Walt argue that contracts without a transfer of title are 'not a sale' and thus cannot be governed by the *CISG* at all.[271] Hachem's view, offered in the data context, is similar: adding that *CISG* article 4(b)'s exclusion of property rules from the *CISG* means that whether or not property can exist in data in the first place is a question that must be settled by reference to the otherwise applicable State law.[272] Resolving this divergence of scholarly opinion will be particularly complicated given that data's capacity to be owned, particularly where it is associated with artificial intelligence, is a thorny legal issue.[273]

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265 Ingeborg Schwenzer, 'Article 79' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 1128, 1129 [1]. See also Garro, 'Opinion 7' (n 261) 169 [2].

266 D Tallon, 'Article 80' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 596, 598 [2.4].

267 Eggen (n 15) 231, 233.

268 Green and Saidov (n 37) 177–8. See also Wulf (n 18) 24–7.

269 Schmitt (n 18) 36–7, 60.

270 Larson (n 101) 467–8.

271 Gillette and Walt (n 15) 51. See also Mowbray (n 86) 123–4.

272 Hachem, 'Annex' (n 9) 82 [14].

273 'Can You Own AI?', *Freshfields TQ Podcast Series* (Freshfields Bruckhaus Deringer, 23 July 2019) 0:00:39–0:03:04, 0:08:26–0:09:16, 0:12:19–0:13:29 <https://www.freshfields.com/en-gb/our-thinking/our-podcasts/technology-quotient-podcast/can-you-own-ai/>; 'How to Protect IP as Part of a Digital Transformation Strategy', *The Allen & Overy Podcast* (Allen & Overy, 15 April 2020) 0:22:05–0:22:30 <https://allenovery.podbean.com/e/how-to-protect-ip-as-part-of-a-digital-transformation-strategy/>;

Another matter remaining ripe for further study implicates Neumann's dominant control test, referred to in 'To Boldly Go, Part I'. As that article explained, Neumann's scholarship puts forward the dominant control test as a means of assessing whether or not the *CISG* governs particular software transactions.[274] The dominant control test is intended to operate as an analytic simplification, overlaying the *CISG*'s application provisions.[275] As I explained in 'To Boldly Go, Part I', this test does not determine whether non-software data trade is governed by the *CISG*. The dominant control test proceeds from an initial assumption that software is within the *CISG*'s scope.[276] No such assumption existed, regarding non-software data, prior to my analysis in this article and in its counterpart.

As noted in my counterpart article, determining whether or not the *CISG* can govern non-software data trade requires (in the first instance) a careful interpretation of the *CISG*'s application provisions. It is only after this analysis is undertaken that analytic simplifications might be developed. Given my conclusions here and in 'To Boldly Go, Part I', the pursuit of an analytic simplification corresponding to Neumann's dominant control test might now be usefully explored in the non-software data context.

Across my analysis of the 'Muñoz provisions', it has been apparent that applying and adapting the *CISG*'s rules to non-software data trade is not always easy. Nevertheless, the problematic issues that I have identified are practical, rather than legal, in nature.[277] As a result, they do not preclude the *CISG*'s application (as a matter of principle) to non-software data cases.

III NON-SOFTWARE DATA TRADE AND THE *CISG*, APPLIED: CRYPTOCURRENCY SALES

Cryptocurrency is an emerging technological phenomenon that is 'here to stay', and that is described as having 'unstoppable momentum'.[278] Like many technological developments coming before it, cryptocurrency presents new

'Maximising Value from Data' (n 11) 0:04:34–0:04:40. See also Trakman, Walters and Zeller, 'Trade in Personal Data' (n 10) 245–7, 249–51, 254–6, 258.

274 Neumann (n 31) 123–7.

275 Ibid 123–4.

276 Ibid 110, 112, 127.

277 Cf Hachem, 'Annex' (n 9) 89 [40].

278 Sarah Green, 'Cryptocurrencies: The Underlying Technology' in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford University Press, 2019) 1, 12 [1.27] ('Cryptocurrencies'). Blockchain technology, upon which cryptocurrencies are based, is described by Gary Barnett of Global Data Plc as a 'super-hyped topic', but one having limited utility outside of the cryptocurrency context: 'The Opportunities and Challenges of Digital Transformation in the Private/Public Sectors: Part 1', *DLA Piper TechLaw Podcast Series* (DLA Piper, 1 April 2019) 0:03:19–0:03:30, 0:24:13–0:25:05 <https://soundcloud.com/user-70946062/the-opportunities-and-challenges-of-digital-transformation-across-the-private-and-public-sectors>. Though blockchain technology is hyped as a recent phenomenon, it is more accurately described as a new manifestation of long-existing technologies: 'Blockchain: Driving Adoption and Navigating Challenges', *DLA Piper TechLaw Podcast Series* (DLA Piper, 22 February 2018) 0:05:56–0:06:27 <https://soundcloud.com/user-70946062/blockchain-driving-adoption-and-navigating-challenges>.

challenges for the *CISG*.[279] One of these is assessing whether cryptocurrency is a valid means of payment for traditional goods under the *CISG*. This question is beyond the scope of my analysis.[280] However, more directly implicated is the *CISG*'s potential application to the trade of cryptocurrency against traditional State-issued money, and to cryptocurrency-against-cryptocurrency transactions. These matters are addressed, respectively, in Parts III(A)–(B) and III(C) below. Resolving them requires application of the non-software data analysis undertaken in Part II of this article, and in 'To Boldly Go, Part I'.

A Cryptocurrency Trade and the *CISG*'s Scope, in Principle

Is trading cryptocurrency against traditional State-issued money governed by the *CISG*? Answering this question affirmatively would, in part, require cryptocurrency to constitute goods for the purposes of *CISG* article 1(1). Different States classify cryptocurrency in different ways, for different purposes.[281] Nevertheless, the *CISG*'s interpretation must be autonomous here:[282] its solution to this problem must therefore be its own.

Determining whether or not cryptocurrency trade falls within the *CISG*'s scope involves a two-stage analysis. First, as identified above, it needs to be determined whether cryptocurrency satisfies *CISG* article 1(1)'s goods criterion. Secondly, if it does, it then needs to be determined whether the *CISG* article 2(d) 'money' exclusion applies. Both considerations are equally important, though for the purposes of this Part, Part III(B)'s *CISG* article 2(d) assessment undertaken below involves novel analysis not yet undertaken in this article. Part II provides a straightforward 'yes' response at the first stage: it is necessary to begin here as assessing whether *CISG* article 1(1)'s goods criterion is satisfied is logically anterior to applying *CISG* article 2(d)'s exclusion. Cryptocurrency trades (which may be conducted algorithmically) 'manifest on computer screens or printouts but are not otherwise in a physical form',[283] with cryptocurrency tokens 'represented by ledger entries internal to the system'.[284] Each unit of cryptocurrency is therefore non-software data. Though it has been argued that cryptocurrency's 'intangible nature' places it outside of the *CISG*'s scope,[285] 'To Boldly Go, Part I' confirmed that tangibility is not a pre-requisite to the *CISG*'s application. As non-software data, cryptocurrency constitutes goods for the purposes of *CISG* article 1(1),[286] a

279 Eggen (n 15) 236.

280 See ibid 235–6; Bayramoğlu (n 23); Takahashi (n 23); Hůlka (n 23) 44–5.

281 Aashna Agarwal and Ananya Bajpai, 'Status of Cryptocurrencies under Investment Law: Not So Cryptic Anymore?' (2019) 7(2) *Indian Journal of Arbitration Law* 1, 5. See, eg, *Quoine Pte Ltd v B2C2 Ltd* [2020] 2 SLR 20, 67–8 [143]–[144] (Sundaresh Menon CJ for the majority); *Ruscoe v Cryptopia Ltd (in liq)* [2020] 2 NZLR 809, 815 [19], 831 [69], 840 [102], 843 [120], 846 [133], 853 [168], 856 [187], 861–2 [209] (Gendall J).

282 *CISG* (n 6) art 7(1).

283 *Quoine Pte Ltd v B2C2 Ltd* [2020] 2 SLR 20, 25 [1] (Sundaresh Menon CJ for the majority). See also at 67–8 [143].

284 Jake Frankenfield, 'Cryptocurrency', *Investopedia* (Web Page, 9 August 2021) <https://www.investopedia.com/terms/c/cryptocurrency.asp>.

285 Bayramoğlu (n 23). See also Takahashi (n 23).

286 Cf Spohnheimer (n 22) 50 [40].

legal conclusion consistent with industry understandings of tokens as constituting a 'product innovation'.[287]

That cryptocurrencies are built upon blockchain and distributed ledger technologies does not affect their characterisation as goods, nor their capacity to otherwise fall within the *CISG*'s scope.[288] These technologies do differentiate cryptocurrency trade from archetypal data trade situations where discrete parcels of data are transferred directly between sellers and buyers:[289] that is, situations where specific data 'arrives' at the buyer's server and at the buyer's server only.[290] Cryptocurrencies work via 'the deliberate process of transferring the value inherent in the asset so that one asset becomes replaced by another',[291] with 'everyone who might want to use the currency … [having] a copy of the ledger' recording '*every* transaction made using that currency'.[292] Cryptocurrency transaction information is shared with 'every user',[293] and private keys are then used to control a cryptocurrency's disposition.[294]

Careful analysis of the *CISG*'s internationality criterion solves this apparent problem. Provided that *CISG* article 1(1)'s goods criterion is satisfied, which Part II establishes would be the case in relation to cryptocurrency, the *CISG*'s application is not contingent upon goods crossing State borders.[295] Though one might ordinarily expect this to happen where traditional goods are at issue,[296] *CISG* article 1(1) only requires that the parties have their 'places of business … in different States'. The *CISG* applies where buyers and sellers are in different States but traditional goods don't move,[297] and also where goods move between third and fourth States.[298] The location of non-software data is therefore irrelevant to the *CISG*'s application.[299] As

287 'The Future of Cryptoassets', *DLA Piper TechLaw Podcast Series* (DLA Piper, 12 April 2019) 0:04:48–0:04:56 <https://soundcloud.com/user-70946062/techlaw-podcast-the-future-of-cryptoassets>.

288 For the same reason, the emerging phenomenon of trade in non-fungible tokens (commonly referred to as NFTs) is also capable of falling within the *CISG*'s scope, subject to the operation of *CISG* article 2(a)'s consumer contracts exception.

289 Hůlka (n 23) 44.

290 Frank Diedrich, 'Maintaining Uniformity in International Uniform Law via Autonomous Interpretation: Software Contracts and the *CISG*' (1996) 8(2) *Pace International Law Review* 303, 336.

291 *Ruscoe v Cryptopia Ltd (in liq)* [2020] 2 NZLR 809, 842 [117] (Gendall J). See also UK Jurisdiction Taskforce, *Legal Statement on Cryptoassets and Smart Contracts* (LawTech Delivery Panel, November 2019) 10 [28]–[31].

292 Green, 'Cryptocurrencies' (n 278) 2 [1.03] (emphasis in original).

293 Ibid 2 [1.04].

294 'ICOs, Blockchain and the Investment Revolution', *DLA Piper TechLaw Podcast Series* (DLA Piper, 12 January 2018) 0:05:35–0:05:43 <https://soundcloud.com/user-70946062/icos-blockchain-and-the-investment-revolution>.

295 Wulf (n 18) 55; Mistelis (n 27) 34 [44]; E Jayme, 'Article 1' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 27, 28 [1.3].

296 Jayme (n 295) 29 [1.5].

297 Benjamin Hayward, 'The *CISG* in Australia: The Jigsaw Puzzle Missing a Piece' (2010) 14(2) *Vindobona Journal of International Commercial Law and Arbitration* 193, 197.

298 See, eg, *Luo v Windy Hills Australian Game Meats Pty Ltd [No 3]* [2019] NSWSC 862. In this case, contracts were entered into by an Australian seller and a Chinese buyer, with the goods to be transported from Pakistan to Vietnam. The Court correctly identified that the *CISG* was applicable, though did not go on to apply its provisions (resorting, incorrectly, to non-harmonised Australian law instead).

299 Hachem, 'Annex' (n 9) 79 [2].

a result, the unique means of transferring cryptocurrency does not place it outside of the *CISG*'s reach.[300]

B Cryptocurrency Trade and *CISG* Article 2(d)'s Money Exclusion

Nevertheless, the *CISG* will not govern cryptocurrency trade if *CISG* article 2(d)'s money exclusion applies. Does cryptocurrency constitute 'money' for the purposes of *CISG* article 2(d)? Three interpretative principles assist in answering this question. First, as noted in Part III(A), *CISG* article 2(d) must be interpreted autonomously. Individual States' approaches to cryptocurrencies' legality and their status as legal tender[301] are therefore irrelevant. Secondly, some of the subject-matter exclusions in *CISG* article 2 are merely clarificatory.[302] Thirdly, as *CISG* article 2 is a provision containing exceptions to the *CISG*'s application, it is to be read narrowly and is not to be given analogous application, in the interests of securing legal certainty.[303]

CISG article 2(d) might, at face value, appear to exclude cryptocurrency transactions from the *CISG*'s scope 'without any doubt'.[304] A more careful analysis, however, identifies this question as being much more complex to resolve.[305] Applying the second and third interpretative principles identified above leads to the conclusion that *CISG* article 2(d) does not, in fact, exclude cryptocurrency trade from the *CISG*'s scope.

Taking those principles together, it becomes apparent that only those *CISG* article 2 exclusions that address transactions otherwise falling within the *CISG*'s scope need to be read narrowly. This follows from the fact that *CISG* article 2's merely clarificatory exclusions relate to subject matters that would have fallen outside of the *CISG*'s scope in any event, making their width immaterial in a practical sense. Since cryptocurrency (as non-software data) is otherwise within the *CISG*'s scope, it can be concluded that *CISG* article 2(d)'s money exclusion must be narrowly construed in this context.

Two competing interpretations might be given to *CISG* article 2(d)'s 'money' exclusion. It may be read as referring only to State-issued money, or alternatively as also including currency 'emitted by private entities',[306] although there is arguably also a third category of case, falling somewhere in between, where State-issued

300 Cf Mowbray (n 86) 129–30.

301 See generally Mara Lesemann, 'Is Bitcoin Legal?: The Legal Status of Bitcoins in the US and Elsewhere', *Investopedia* (Web Page, 27 August 2021) <https://www.investopedia.com/ask/answers/121515/bitcoin-legal-us.asp>.

302 Ingeborg Schwenzer and Pascal Hachem, 'Article 2' in Ingeborg Schwenzer (ed), *Schlechtriem & Schwenzer: Commentary on the UN Convention on the International Sale of Goods (CISG)* (Oxford University Press, 4th ed, 2016) 47, 48 [3]; Spohnheimer (n 22) 49–50 [36], 52 [47]; W Khoo, 'Article 2' in CM Bianca and MJ Bonell (eds), *Commentary on the International Sales Law* (Giuffrè, 1987) 34, 38–9 [2.7]; Eggen (n 15) 230. Cf Enderlein and Maskow (n 130) 35–6 [8].

303 Schwenzer and Hachem, 'Article 2' (n 302) 48 [3], 50 [7]; Spohnheimer (n 22) 40 [4], 48 [31].

304 Bayramoğlu (n 23). See also Lorenz (n 22) 36 [8].

305 Eggen (n 15) 236–7.

306 Spohnheimer (n 22) 50 [40].

money has a souvenir status.[307] Narrowly interpreting *CISG* article 2(d)'s money exclusion requires that the State-issued money reading be preferred. If *CISG* article 2(d) only excludes State-issued money from the *CISG*'s scope, transactions involving the exchange of cryptocurrency (as goods) against State-issued money (as payment) are unaffected by the provision: even if cryptocurrency was considered in any particular jurisdiction to be legal tender.[308] This interpretation is consistent with the Secretariat Commentary on the 1978 Draft Convention identifying 'significant differences in the application of this *Convention*' as a potential problem that *CISG* article 2(d) seeks to avoid.[309] Such differences should not arise regarding cryptocurrency, provided (as with any type of goods trade) that *CISG* article 7(1)'s autonomous interpretation requirement is observed.

A further nuance arises, however, in relation to a particular sub-category of cryptocurrencies: those issued by central banks. Though cryptocurrency fungibility is assumed by some existing literature,[310] not all cryptocurrencies are alike. Central bank digital currencies ('CBDC's') differ from other cryptocurrencies in one critical respect for *CISG* article 2(d)'s purposes: they have State backing, and also constitute legal tender in their issuing State for that reason.[311] Though CBDC's are not yet common, some States are 'dabbling' in this area,[312] and China in particular has taken significant steps towards launching its digital yuan.[313] If *CISG* article 2(d) is read as referring to State-issued money, CBDC trade (as one particular type of cryptocurrency trade) would actually be excluded from the *CISG*'s scope.

At first glance, the *CISG*'s differing application to these two types of cryptocurrencies might appear artificial. It must nevertheless be kept in mind that although CBDC's have no physical representation via notes and coins, traditional State-issued money is often transacted electronically in any event:[314] even more

307 Award, China International Economic & Trade Arbitration Commission, CISG/2000/17, 2000 [tr Zheng Xie] <http://www.cisg-online.org/files/cases/7533/translationFile/1614_67651696.pdf>. Such cases are distinct from those involving old currency that is no longer legal tender but has collectable status: Schwenzer and Hachem, 'Article 2' (n 302) 57 [26]; ibid; Lorenz (n 22) 36 [8].

308 As is the case now in El Salvador, with respect to Bitcoin: Jose Cabezas, 'El Salvador Becomes First Country in the World to Accept Cryptocurrency Bitcoin as Legal Tender', *ABC News* (online, 7 September 2021) <https://www.abc.net.au/news/2021-09-07/el-salvador-adopts-bitcoin-crypocurrency-as-legal-tender/100441472>.

309 United Nations Commission on International Trade Law Secretariat, 'Commentary on the Draft Convention on Contracts for the International Sale of Goods, Prepared by the Secretariat' in United Nations (ed), *United Nations Conference on Contracts for the International Sale of Goods, Vienna, 10 March – 11 April 1980, Official Records: Documents of the Conference and Summary Records of the Plenary Meetings and of the Meetings of the Main Committees* (United Nations, 1991) 14, 16 [7].

310 Eggen (n 15) 229, 236–7.

311 Agarwal and Bajpai (n 281) 4–5. See generally 'Talking Tech @ Singapore Fintech Festival: Major Shifts in AI, Digital Currency and Cybersecurity', *The Clifford Chance Podcast* (Clifford Chance, 18 December 2020) 0:02:37–0:05:09 <https://www.cliffordchance.com/insights/resources/podcast-library/all-podcasts/singapore-fintech-festival-major-shifts-in-ai-digital-currency-and-cybersecurity.html>.

312 Agarwal and Bajpai (n 281) 7.

313 Peter Kundzic, 'Chinese Central Bank to Give Away 10 Million in Digital Currency in First Public Trial of New Payment System', *ABC News* (online, 10 October 2020) <https://www.abc.net.au/news/2020-10-10/china-to-issue-10-million-digital-yuan-in-first-public-test/12750320>.

314 See, eg, 'In Credit Podcast: Access to Cash and the UK's FCA Occasional Paper', *The Allen & Overy Podcast* (Allen & Overy, 15 December 2020) 0:02:12–0:2:22 <https://allenovery.podbean.com/e/in-

so during the COVID-19 pandemic.[315] Analogising CBDC's with traditional State-issued money, for *CISG* article 2(d)'s purposes, therefore has at least some practical basis.

Differentiating CBDC's from other cryptocurrencies for the purposes of the *CISG*'s application is not dissimilar to the existing distinction between equivalent traditional and digital goods that has plagued sales laws around the world[316] and that I otherwise remedy (in the *CISG* context) in this article.[317] This particular CBDC problem arguably reflects the law's overall 'nascent' ability to deal with cryptocurrencies.[318] Any inconvenience arising from this particular differential treatment issue is outweighed, however, by the many practical and policy advantages of analysing the *CISG*'s capacity to regulate non-software data trade. These advantages were explored, in detail, in 'To Boldly Go, Part I'.

C Cryptocurrency-Against-Cryptocurrency Transactions and the *CISG*

Cryptocurrency-against-cryptocurrency transactions are a variation on the problem addressed in Parts III(A)–(B) above. As there are 'many different types of cryptocurrency',[319] they are capable of being traded against each other,[320] as well as against traditional money. To the best of my research, the *CISG*'s capacity to govern cryptocurrency-against-cryptocurrency trade has not yet been addressed

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credit-podcast-access-to-cash-and-fca-occasional-paper/>; 'EP40 COVID-19: Digitalise to Survive and Thrive (Australia)', *Catalyst Podcast Series* (Herbert Smith Freehills, 3 June 2020) 0:21:37–0:22:18 <https://www.herbertsmithfreehills.com/latest-thinking/catalyst-the-podcast-series-for-an-era-of-change>; Swedish Institute, 'A Cashless Society', *Sweden* (Web Page, 1 June 2021) <https://sweden.se/life/society/a-cashless-society>; David B Black, 'Who Needs Cryptocurrency FedCoin when We Already Have a National Digital Currency?', *Forbes* (online, 1 March 2020) <https://www.forbes.com/sites/davidblack/2020/03/01/who-needs-cryptocurrency-fedcoin-when-we-already-have-a-national-digital-currency/?sh=2efd06ce4951>.

315 Jack Parkin, 'Cashless Payment Is Booming, Thanks to Coronavirus. So Is Financial Surveillance', *The Conversation* (Blog Post, 10 September 2020) <https://theconversation.com/cashless-payment-is-booming-thanks-to-coronavirus-so-is-financial-surveillance-145179>. See also 'Talking Tech @ Singapore Fintech Festival: Perspectives, Predictions and the "Pandemic Push"', *The Clifford Chance Podcast* (Clifford Chance, 14 December 2020) 0:01:37–0:01:56 <https://www.cliffordchance.com/insights/resources/podcast-library/all-podcasts/talking-tech-singapore-fintech-festival-paul-landless.html>; 'Continued Innovation' (n 10) 0:04:52–0:05:13.

316 See, eg, *Gammasonics Institute for Medical Research Pty Ltd v Comrad Medical Systems Pty Ltd* (2010) 77 NSWLR 479, 480 [5]–[6], 488–9 [44]–[47] (Fullerton J).

317 See generally Green, 'Sales Law' (n 12) 78, 93–4; Christopher Kee, 'Rethinking the Common Law Definition of Goods' in Andrea Büchler and Markus Müller-Chen (eds), *Private Law: National – Global – Comparative: Festschrift Für Ingeborg Schwenzer Zum 60. Geburtstag* (Intersentia, 2011) 925, 931–3; Jacob Ziegel, 'The Scope of the *Convention*: Reaching Out to Article One and Beyond' (2005) 25(1) *Journal of Law and Commerce* 59, 61; Dan Jerker B Svantesson, '*Amlink Technologies Pty Ltd and Australian Trade Commission* [2005] AATA 359: Software Finally Recognised as "Goods"' (2005) 13(4) *Trade Practices Law Journal* 232, 233–4. Cf Trevor Cox, 'Chaos versus Uniformity: The Divergent Views of Software in the International Community' [2000] (3) *Business Law International* 359, 362–3.

318 Green, 'Cryptocurrencies' (n 278) 12 [1.26].

319 Equity Trust, 'Types of Cryptocurrency Explained', *Investor Insights Blog* (Blog Post, 2021) <https://www.trustetc.com/blog/cryptocurrency-types/>.

320 See, eg, *Quoine Pte Ltd v B2C2 Ltd* [2020] 2 SLR 20, 25–6 [2], 27 [9], 29 [14] (Sundaresh Menon CJ for the majority), 71 [154] (Mance IJ); *Ruscoe v Cryptopia Ltd (in liq)* [2020] 2 NZLR 809, 814 [5] (Gendall J).

in the literature, and at the time of writing no cases of any kind involving cryptocurrency as the contractually described goods are recorded in the *CISG-Online* database.[321] Given my conclusion that cryptocurrencies satisfy *CISG* article 1(1)'s goods criterion, and that they are not excluded via *CISG* article 2(d) on the basis of being money, cryptocurrency-against-cryptocurrency trade emerges as a type of exchange of goods: a factual adaptation of barter with respect to traditional goods. The *CISG*'s capacity to govern cryptocurrency-against-cryptocurrency trade therefore depends upon the *CISG*'s more general capacity to regulate barter, which remains a matter of debate.[322]

Resolving this debate is well beyond the scope of this article. In general terms, however, it can be observed that accepting barter trade as being governed by the *CISG* rests upon a presumption that the *CISG*'s price requirement need not be satisfied by money.[323] If this view turns out to be correct, the conclusion that cryptocurrency-against-cryptocurrency trade is governed by the *CISG* would follow. That conclusion, in turn, would be consistent with Part III(B)'s proposition that cryptocurrency is not money for the purposes of *CISG* article 2(d).

IV CONCLUSION

According to the business community, the future of commerce is digital. This much was made clear in the International Chamber of Commerce's *Trading Thoughts* podcast exchange quoted in the introductory remarks of 'To Boldly Go, Part I'.[324] In particular, in that exchange, it was asserted that 'the future of business is clearly changing', and that '[t]he future brick and mortar and Ma and Pa shops appear clearly dead'.[325] Returning to *Trading Thoughts*, the following comments offered by Tim Conley[326] ('TC') and Angel Gurría[327] ('AG') in the COVID-19 context reinforce this digitalisation message:

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321 Determined by searching for decisions involving 'cryptocurrency' in the '[g]oods as per contract' field of the *CISG-Online* database's case law search form: Faculty of Law, University of Basel (n 26).

322 Schwenzer, Hachem and Kee (n 27) 113 [8.18]; Schwenzer and Hachem, 'Article 1' (n 16) 31–2 [11]; Mistelis (n 27) 29 [30]; David Fairlie, 'A Commentary on Issues Arising under Articles 1 to 6 of the *CISG* (with Special Reference to the Position in Australia)' in Singapore International Arbitration Centre (ed), *Celebrating Success: 25 Years United Nations Convention on Contracts for the International Sale of Goods* (2006) 39, 46; Peter Schlechtriem, 'Requirements of Application and Sphere of Applicability of the *CISG*' (2005) 36(4) *Victoria University of Wellington Law Review* 781, 787. For a recent analysis of this issue: see Marco Torsello, 'Sales Law beyond Sales Contracts: Applicability and Application of the *CISG* to Non-sales Transactions (the Case of Countertrade and Barter Transactions)' (2019–20) 38(1) *Journal of Law and Commerce* 273, 294–303.

323 Schwenzer, Hachem and Kee (n 27) 113 [8.18]; Schwenzer and Hachem, 'Article 1' (n 16) 31–2 [11]; Mistelis (n 27) 29 [30].

324 'Trading Thoughts with Gabriel Petrus of ICC's World Chambers Federation', *Trading Thoughts Podcast* (International Chamber of Commerce, 3 May 2020) 0:03:04–0:06:05 <https://soundcloud.com/iccwbo/chambers-of-commerce-in-the-21st-century>.

325 Ibid 0:05:55–0:06:05. See also 'Branding' (n 139) 0:15:05–0:15:40.

326 Global Communications Officer, International Chamber of Commerce.

327 Secretary-General, Organisation for Economic Cooperation and Development.

> TC: Digital connectivity is obviously another issue. While large companies have generally transitioned their operations digitally, SMEs [small and medium-sized enterprises] have lacked the same opportunity. The OECD [Organisation for Economic Cooperation and Development] Digital for SMEs Global Initiative has hosted roundtable discussions and published resources on the importance of closing this gap. What can businesses, international organisations, and governments do to support SME digitalisation?
>
> AG: The question of using digital progress, digital technology to benefit the SMEs is absolutely crucial. We had here at the OECD, with many ministers attending, a ministerial-level discussion precisely on … SMEs and going digital. That was found to be one of the most promising, one of the most productive areas of discussion. Because you cannot consider that because you have an SME that it is low-tech … even if it has only a few employees, it can be relatively sophisticated, relatively high-tech, and therefore able to connect with the rest of the world through electronic means and technology. So the question … is, I would say, absolutely central to the challenge of which SMEs are going to make it …[328]

The *CISG* is 'truly a law for merchants',[329] and its capacity to benefit business sits firmly behind Australia's decision to accede as the *CISG*'s 16th Contracting State.[330] Despite the *CISG*'s text dating from the same year that Commodore's VIC-20, Sinclair's ZX80, the World Wide Web's predecessor, and the world's first microcomputer hard drive were launched,[331] the *CISG* has proved remarkably adaptable to changing times.[332] As 'To Boldly Go, Part I' noted, the *CISG*'s contract formation rules support electronic contracting (and possibly also smart contracts), its understanding of writing includes electronic communications, and the *CISG* accommodates electronic software trade. While software has been the focus of existing *CISG* scholarship concerning intangibles,[333] my analysis has demonstrated that the *CISG* is equally capable of regulating non-software data trade. The *CISG* thus stands ready to boldly go where no existing case law (but where much international trade) has gone before. Software has been described as 'an ally for achieving the *CISG* objectives'.[334] The same can now be said for non-software data, and (as a result) data as an overall category of goods.

My main focus in this article has been *CISG* article 1(1)'s goods criterion (in Part II), its application to non-software data (also in Part II), and the implications of my analysis for cryptocurrency trade (in Part III).[335] *CISG* article 1(1)'s goods criterion is the first element of the framework that I previously established in 'To

328 'Trading Thoughts with OECD Secretary General Angel Gurría', *Trading Thoughts Podcast* (International Chamber of Commerce, 29 May 2020) 0:08:42–0:10:28 <https://soundcloud.com/iccwbo/icc-trading-thoughts-oecd-secretary-general-angel-gurria>.

329 Jessica Viven-Wilksch, 'How Long Is Too Long to Determine the Success of a Legal Transplant? International Doctrine and Contract Law in Oceania' in Vito Breda (ed), *Legal Transplants in East Asia and Oceania* (Cambridge University Press, 2019) 132, 138.

330 Ian Govey and Christopher Staker, '*Vienna Sales Convention* Takes Effect in Australia Next Year' (1988) 23(5) *Australian Law News* 19, 19.

331 Computer History Museum, '1980', *Timeline of Computer History* (Web Page, 2021) <https://www.computerhistory.org/timeline/1980/>.

332 Muñoz (n 15) 301.

333 Eggen (n 15) 230.

334 Muñoz (n 15) 301.

335 Green, 'Sales Law' (n 12) 78.

Boldly Go, Part I'. That specific legal framework comprises *CISG* article 1(1)'s goods criterion, *CISG* article 1(1)'s sale criterion, and *CISG* article 3's rules on mixed contracts. Applying this framework, as this article and 'To Boldly Go, Part I' have done, is the correct legal basis for assessing the *CISG*'s capacity to govern non-software data trade.

An application of *CISG* article 1(1)'s goods criterion demonstrates that non-software data falls within the *CISG*'s scope as a matter of principle. However, as explained in 'To Boldly Go, Part I', *CISG* article 1(1)'s sale criterion and *CISG* article 3's rules on mixed contracts are essential additional considerations. They determine whether *particular* non-software data contracts fall to be regulated by the *CISG*. They therefore place essential limitations on the *CISG*'s capacity to govern non-software data trade. This is a matter of significant practical importance, as data contracts 'may take many forms', not all of which resemble the sale of goods.[336] Together, these three criteria ensure that the *CISG* only applies to transactions for which it (as a sales law) is genuinely suited. They therefore strike a balance between over-inclusiveness and under-inclusiveness in the *CISG*'s digital operation.[337] 'To Boldly Go, Part I' explored the practical and policy benefits of assessing the *CISG*'s capacity to govern non-software data trade. Despite these benefits, the *CISG*'s application should not be stretched beyond what its principled interpretation permits.[338]

Concluding that non-software data trade can be governed by the *CISG* may sound 'revolutionary', but despite the importance of this conclusion, my analysis is actually an incremental advance on existing *CISG* software scholarship.[339] This is crucial from the perspective of the *CISG*'s Contracting States, as explored in 'To Boldly Go, Part I'. A cautious approach to interpreting the *CISG*'s application provisions is justified by the provisions' public international law nature.[340] Incremental (rather than radical) interpretative advances concerning those provisions are essential in order to ensure the *CISG*'s continued acceptance by States. This is a matter that is just as important for the *CISG*'s future success as its take-up by commercial parties in individual transactions. This article and its counterpart take care 'not to upset such dynamics'.[341] In particular, my analysis has been consistently grounded in *CISG* articles 7(1) and 7(2)'s interpretative and gap-filling rules. These are rules to which States necessarily agree, by virtue of States' accessions to the *CISG*.[342]

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336 Richard Raysman et al, ALM, *Intellectual Property Licensing: Forms and Analysis* (online at 2020) §2.01.

337 Moses (n 180) 400.

338 Green, 'Sales Law' (n 12) 94. Cf Cox (n 317) 378.

339 Cf Michael D Scott, 'Contemporary Issues in Domestic Transactions for Computer Goods and Services' (1989–90) 3 *Software Law Journal* 615, 615.

340 Olaf Meyer, 'Constructive Interpretation: Applying the *CISG* in the 21st Century' in André Janssen and Olaf Meyer (eds), *CISG Methodology* (Sellier European Law Publishers, 2009) 319, 329–30.

341 Renaud Sorieul, Emma Hatcher and Cyril Emery, 'Possible Future Work by UNCITRAL in the Field of Contract Law: Preliminary Thoughts from the Secretariat' (2013) 58(4) *Villanova Law Review* 491, 492. See also Eggen (n 15) 231.

342 *CISG* (n 6) art 98.

There will necessarily come a time when the *CISG* has outlived its usefulness. As one commentator has suggested, 'renovation of the *CISG* will take place sooner or later'.[343] Still, that time has not yet come. Although the *CISG*'s application to non-software data trade is a bold next step, there is not yet any indication that it will be the *CISG*'s final frontier.[344] The *CISG* has a history of successful adaptation to the many commercial and technological changes that have occurred between 1980 and today.

As to whether the interpretations I advocate in this article and in its counterpart will be consistently applied across jurisdictions in litigation and in arbitral proceedings, only time will tell.[345] Identification of the law governing online transactions is an issue that has been analysed since the very advent of electronic commerce,[346] and the absence of any supranational court having appellate jurisdiction concerning the *CISG* means this issue will ultimately fall to be decided by individual courts in each Contracting State.[347] As making reference to scholarship comprises one aspect of *CISG* article 7(1)'s interpretative directives,[348] however, my analysis will play its part within the *CISG*'s global jurisconsultorium.[349]

As explained by Green, a more 'universal' understanding of digitised material's capacity to constitute goods for the purposes of sales laws 'would be ideal': 'not only because it is conceptually sound, but because a unified legal response is always to be welcomed in an environment such as the digital marketplace, in which geographical boundaries are meaningless'.[350] Addressing the *CISG* as an *international* sales law, the analysis I have conducted in this article (and in 'To Boldly Go, Part I') is ultimately directed at benefiting merchants, their trading activities, their advisers, and the broader economies within which they operate: both in Australia, and beyond.

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343 Leandro Tripodi, *Towards a New CISG: The Prospective Convention on the International Sale of Goods and Services* (Brill Nijhoff, 2015) 12. See also 'The *CISG* and Comparative Law: Prof Alejandro Garro', *Cafe Comparatum* (International Academy of Comparative Law, 18 November 2020) 0:33:59–0:35:12 <https://cafecomparatum.podbean.com/e/episode-2-the-cisg-and-comparative-law-%E2%80%94-prof-alejandro-garro/>.

344 To give one example of another emerging area of *CISG* study, efforts are currently underway to explore the *CISG*'s potential as a visual contracting tool. This matter was recently addressed by Camilla Andersen at a series of presentations given to celebrate the *CISG*'s 40th anniversary: 'Celebrating the 40th Anniversary of the *CISG*: *CISG* as a Tool for Global Trade – Theory and Practice', *Asian Academy of International Law* (Web Page, 2020) <https://aail.org/cisg/>. For the broader project: see generally 'Welcome to Comic Book Contracts', *Comic Book Contracts* (Web Page) <https://www.comicbookcontracts.com/>.

345 Cf Andersen (n 1) 913–15; Moses (n 180) 416–17; Cox (n 317) 364.

346 de Zwart (n 76) 306.

347 Ben Köhler, 'For an Independent Development of the *CISG* beyond Article 7(2): A Stocktake and a Proposal' in Zlatan Meškić et al (eds), *Balkan Yearbook of European and International Law 2020* (Springer, 2021) 3, 7, 20, 23.

348 João Ribeiro-Bidaoui, 'The International Obligation of the Uniform and Autonomous Interpretation of Private Law Conventions: Consequences for Domestic Courts and International Organisations' (2020) 67(1) *Netherlands International Law Review* 139, 149 [3.2.2]. See also ibid 20; Michael P Van Alstine, 'Dynamic Treaty Interpretation' (1998) 146(3) *University of Pennsylvania Law Review* 687, 788–9.

349 See generally Andersen (n 1) 923. See also Chief Justice Susan Kiefel, 'The Academy and the Courts: What Do They Mean to Each Other Today?' (2020) 44(1) *Melbourne University Law Review* 447, 454–7.

350 Green, 'Sales Law' (n 12) 82. See also de Zwart (n 76) 306.