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The Prospects and Limits of Blockchain Technologies in the Global Protection of Geographical Indications

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Abstract

One of the dynamics of the technology age is the rise of intermediaries to complement or replace institutions traditionally tasked with performing everyday transactions. Blockchain technologies are one of the most disruptive advances of the technology age. It is set to revolutionize diverse transactions and will impact many aspects of existing global legal norms. This article is a law and policy-oriented analysis of the relevance of blockchain technologies to the development and sustenance of geographical indication (GI) industries globally. Recognizing that there are profound relationships between emerging technologies and intellectual property (IP) rights, the article analyzes what viable interlinkages can be forged between GI and blockchain technologies when globally there are conceptual and legal divergences in GI protection. The article identifies and evaluates four interconnections between blockchain technologies and GIs. These include the technology's use as a differentiated platform for IP protection, the potential benefits and challenges of concluding GI transactions through smart contracts, and the extent of legal security provided by the technology's ability to verify and trace transactions. The article also makes recommendations on how best to build sustainable relationships between GIs, the international and domestic IP system, and blockchain technologies.

Résumé

L'augmentation du nombre d'intermédiaires nécessaires pour compléter ou remplacer les institutions traditionnellement responsables d'effectuer les transactions quotidiennes est une des dynamiques de l'ère technologique. La technologie de chaîne de blocs est une des avancées les plus perturbatrices de l'ère technologique. Elle devrait révolutionner diverses transactions et influencer plusieurs aspects des normes juridiques mondiales en place. Cet article est une analyse axée sur le droit et la politique de la pertinence des technologies de chaîne de blocs pour le développement et la survie des industries d'indications géographiques (IG) à l'échelle planétaire. Tout en reconnaissant l'existence de profondes relations entre les technologies émergentes et les droits de propriété intellectuelle (PI), l'article analyse les interconnexions qui pourraient être forgées lorsque, sur le plan international, la protection des IG comporte des divergences conceptuelles et juridiques. L'article détermine et évalue quatre interconnexions entre les technologies de chaînes de bloc et les IG, notamment l'emploi de la technologie à titre de plateforme différenciée pour la protection des IG, les avantages et les inconvénients possibles de conclure des transactions d'IG à l'aide de contrats intelligents et l'étendue de la sécurité juridique fournie par la capacité de la technologie à vérifier et suivre les transactions. L'article présente également certaines recommandations sur l'optimisation de la création et de l'entretien de relations durables entre les IG, le système international et domestique de la PI et les technologies de chaîne de blocs.

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1.0 Introduction

The results of technological innovation are more evident now than they were a decade ago.¹ New developments are disrupting traditional modes of production, services, and the way businesses interact with consumers and other enterprises.² Blockchains are one of the major propellants of change in the fourth industrial revolution. This article adds to the emerging literature on blockchain and intellectual property (IP)³ and analyzes, from an IP law and policy perspective, whether blockchain technologies are useful in the protection of geographical indication (GI) industries—specifically, those that relate to foods and other consumer goods, but not wine or spirits.⁴ GIs are signs or symbols that convey that a product has a directly traceable relationship with its geographic origin based on its quality, characteristic, or reputation.⁵ This relationship should be evident in the product's taste (in the case of foods), its effect (in the case of natural products), or its aesthetic nature (in the case of jewellery or other consumer items).⁶ Some examples of GIs include Japan's Kobe beef, Darjeeling tea from India, Café de Colombia from Colombia, Danablu cheese from Denmark, Emmentaler cheese from Switzerland, Swiss chocolates, and Canadienne Cow Cheese from Quebec.

The article proceeds as follows. It first presents a general overview of the workings of blockchain technology. It then addresses the legal aspects of GIs, using both domestic and international references to illustrate what GI rights usually cover and how different jurisdictional perspectives on GIs either restrict or expand their protection. The article then offers an analysis of how

blockchain technologies can be used in GI industries, particularly in promoting accountability within GI producer groups and establishing proof of provenance. This section also discusses the efficacy of blockchain technologies in combatting GI infringements, as well as the challenges and limits of the blockchain technologies in GI-intensive industries, and the development of coherency in and harmonization of GI laws globally. The article then provides recommendations on building solid partnerships between GIs and blockchain, to the extent that workable intersections between the two areas can be created, and offers a brief conclusion. The article does not cover all of the many law and governance issues that may arise in respect of GIs,⁷ nor does it exhaustively consider factors that influence approaches to GI laws.⁸

2.0 The Emerging Technology of Blockchain: What It Is

Blockchain technologies are innovative distributed ledger protocols that allow decentralized interactions between various business units or actors to facilitate specific transactions or accomplish set tasks.⁹ Blockchain and its application are not centralized but operate on computers located anywhere in the world; in this context, blockchain-based systems are “distributed” and decentralized. Each block is time-stamped and stores information on a ledger, which is then verified and cleared by the preceding block. Without information that corresponds in some fundamental way with the preceding block, no subsequent block can be added to the chain. Therefore, the chain conveys historical transactions that links and verifies each of its blocks. Blockchain technologies have produced innovations in currency, such as bitcoin,¹⁰ and other

- 1 RabeH Morrar, “The Fourth Industrial Revolution (Industry 4.0): A Social Innovation Perspective” (2017) 7:11 Tech Inno Manag Rev 12.
- 2 Dragos Tohanean, “Innovation, A Key Element of Business Models in the Fourth Industrial Revolution” (2018) 6:12 N Intell Studies 121; Margaret Ann Wilkinson, “What Is the Role of New Technologies in Tensions in Intellectual Property?” in Tana Pistorius, ed, *Intellectual Property Perspectives on the Regulation of New Technologies*, ATRIP Intellectual Property Series (Cheltenham, UK: Edward Elgar, 2018) ch 1.
- 3 TV Shatkovskaya et al, “Impact of Technological Blockchain Paradigm on the Movement of Intellectual Property in the Digital Space” (2018) 27 Eur R Stud suppl Special Issue 1 397; Gönenç Gürkaynak, “Intellectual Property Law and Practice in the Blockchain Realm” (2018) 34:4 Comp L Sec Rev 847; Angela Guo, “Blockchain Receipts: Patentability and Admissibility in Court” (2017) 16:2 Chicago-Kent J IP 440; Michael Loney, “China Companies Dominate Global Blockchain Patent Rankings”, *Managing IP* (13 February 2018).
- 4 There are far fewer conflicts concerning the protection of wine and spirit GIs because the *Agreement on the Trade Related Aspects of Intellectual Property* (*infra* note 18) mandates for significantly high levels of protection for these products, but not for other place-based goods.
- 5 *Trademarks Act*, RSC 1985, c T-13, s 2 [*Trademarks Act*]; Michael Blakeney, *The Protection of Geographical Indications, Law and Practice* (Cheltenham, UK: Edward Elgar, 2014); Dev S Gangjee, “From Geography to History: Geographical Indications and the Reputational Link” in Irene Calboli & Ng-Loy Wee Loon, eds, *Geographical Indications at the Crossroads of Trade, Development, and Culture: Focus on Asia-Pacific* (Cambridge, UK: Cambridge University Press, 2017) ch 4; Tesh W Dagne, “The Narrowing Transatlantic Divide: Geographical Indications in Canada’s Trade Agreements” (2016) 10 Eur Rev IP Law 598.
- 6 Michael Blakeney, *The Protection of Geographical Indications, Law and Practice* (Cheltenham, UK: Edward Elgar, 2014).
- 7 Marsha Simone Cadogan, “Making Agricultural and Food-Based Geographical Indications Works in Canada”, CIGI Policy Brief No 125, online: <<https://www.cigionline.org/publications/making-agricultural-and-food-based-geographical-indications-work-canada>>; Barbara Pick, Delphine Marie-Vivien & Dong Bui Kim, “The Use of Geographical Indications in Vietnam: A Promising Tool for Socioeconomic Development?” in Calboli & Wee Loon, *supra* note 5, ch 13.
- 8 Susy Frankel, “Geographical Indications and Mega-Regional Trade Agreements and Negotiations” in Calboli & Wee Loon, *supra* note 5, ch 6.
- 9 Christian Catalani et al, “Some Simple Economics of the Blockchain” (21 September 21 2017), Rotman School of Management Working Paper No 2874598, MIT Sloan Research Paper No 5191-16, online: SSRN <<https://ssrn.com/abstract=2874598>>; Don Tapscott et al, *Blockchain Revolution* (Toronto: Penguin Canada, 2016) ch 1, 5; Mark Pilkington, “Blockchain Technology: Principles and Applications” (18 September 2015), in F Xavier Olleros & Majlinda Zhegu, eds, *Research Handbook on Digital Transformations* (Cheltenham, UK: Edward Elgar, 2016), online: SSRN <<https://ssrn.com/abstract=2662660>>.
- 10 Satoshi Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System”, online: <<https://bitcoin.org/bitcoin.pdf>>; Nicolas Houy, “The Bitcoin Mining Game” (2016) 1:1 Ledger 53.

altcoin cryptocurrencies¹¹ that are used in commerce as electronic cash. In addition to bitcoin and cryptocurrencies, several other blockchains are being developed, or have already been created, using Ethereum, which allows computer programs to execute transactions on the blockchain system, essentially operating as a computational system within the blockchain. One of the most innovative aspects of blockchain technology is that it makes disintermediation possible; that is, it makes the need for third-party involvement in transactions redundant because the blockchain itself functions as the intermediary.

The development and use of blockchain technologies will, over time, affect economies that use these technologies, and influence transactions and technological developments in other jurisdictions. Bitcoins are now acceptable forms of commodities in jurisdictions such as Canada, the United States, Finland, Australia, and Belgium.¹² Cryptocurrencies have been integrated into web-based tutorial programs as reward tokens for accomplished students.¹³ Blockchain is a disruptive technology in its potential to drive innovation and creativity. One of the more interesting aspects of blockchain is the distributed ledger technology, which makes it possible for a wide array of transactions to be performed on the blockchain platform. These include smart contracts,¹⁴ which are computational encoded tools in the chain that perform self-executing transactions on behalf of the parties to a transaction. Smart contracts are legally binding automated configurations on a blockchain that make transactions possible, doable, and executable, as contemplated by the blockchain, if certain terms or conditions are met.¹⁵

Developments in blockchain and distributed ledger technology have spurred interest in the IP aspect of the technology.¹⁶ The remainder of this article focuses on the interface between blockchain and GIs from an IP protection perspective.

3.0 The Big Deal (or Not) About Geographical Indications

GIs are signs, symbols, or words affiliated with products¹⁷ that convey a directly traceable relationship between the product and its place of origin based on its characteristics, reputation, or quality. This definition is captured in all international and domestic legal definitions of GIs, from TRIPS¹⁸ to the Lisbon Agreement on GIs and appellations of origin,¹⁹ to the references to GIs in the Paris Convention,²⁰ to the federal *Trademarks Act* definition of GIs.²¹ Because of this relationship between the product and its place and the way in which it is produced, the product is usually seen as the GI itself, not just the word or symbol associated with the product.²² This is because the inextricable linkage between the product and place should create such a distinct taste, look, or effect of the product that it cannot be easily duplicated elsewhere.²³ For example, Quebec's Ice Cider is a protected GI under provincial legislation, and obtained its registration on the basis of the "characteristics related to the history of apple production in Québec; the subsequent development of cider production; and the innovation consisting of concentrating the sugars in the apple and juice using natural cold."²⁴

Other examples of product-place connection relevant to this discussion are specific chemical and pharmaceutical products made in Switzerland that have essential ties to the country and are

- 11 Altcoins are electronic currencies that are alternatives to bitcoin; they include lite coin, terracoin, and byte coin. See Cointelegraph, "Altcoin News", online: <<https://cointelegraph.com/tags/altcoin>>.
- 12 For example, Finland classifies bitcoin as a commodity, holding that it does not meet the definition of an official currency. See Kati Pohjanpalo, "Bitcoin Judged Commodity in Finland After Failing Money Test" (19 January 2014), *Bloomberg*, online: <<https://www.bloomberg.com/news/articles/2014-01-19/bitcoin-becomes-commodity-in-finland-after-failing-currency-test>>.
- 13 Gunnar Stefansson et al, "From Smileys to Smileycoins: Using a Cryptocurrency in Education" (2017) 2 *Ledger* 38, online: <<https://ledgerjournal.org/ojs/index.php/ledger/article/view/103>>.
- 14 See also Joshua S Gans, "The Fine Print in Smart Contracts" (13 January 2019), online: SSRN <<https://ssrn.com/abstract=3309709>>.
- 15 Benito Arruñada & Luis Garicano, "Blockchain: The Birth of Decentralized Governance" (11 May 2018), online: SSRN <<https://ssrn.com/abstract=3160070>>.
- 16 See, for example, Bridget Clark et al, "Blockchain, IP and the Fashion Industry", *Managing Intellectual Property* (7 March 2017); Patrice Pojul, "Online Film Production in China Using Blockchain and Smart Contracts: The Development of Collaborative Platforms for Emerging Creative Talents" (Switzerland: Cham, 2019); Shanna Sanders, "This Intellectual Property Is Worth a Lot of Bitcoin: What's Protecting This Disruptive Blockchain Technology?", *The Idaho Business Review* (9 November 2018).
- 17 If domestic legislation permits, GIs can also be affiliated with service-oriented industries. To date, Serbia is the only country in the world to have registered a service—Cigota—as a GI, in relation to health tourism. Dragomir Kojic & Tamara Bubalo, "Geographical Indications of Origin in Serbia: Where the Past Fuels the Future" *Lexology* (21 May 2018) online: <<https://www.lexology.com/library/detail.aspx?g=52cb27a3-6142-4dc6-8c77-c962ceda6c3a>>.
- 18 World Trade Organization, *Agreement on Trade Related Aspects of Intellectual Property Rights*, annex 1C, online: <https://www.wto.org/english/docs_e/legal_e/27-trips.pdf> [TRIPS].
- 19 *Geneva Act on the Lisbon Agreement for the Protection of Appellations of Origin and Geographical Indications* (as adopted 20 May 2015), online: <<https://wipolex.wipo.int/en/treaties/textdetails/15625>>. See also Daniel Gervais, "A Look at the Geneva Act of the Lisbon Agreement: A Missed Opportunity?" in Calboli & Wee Loon, *supra* note 5, ch 5.
- 20 *Paris Convention for the Protection of Intellectual Property* (as amended 28 September 1975) arts 10, 10 bis.
- 21 *Trademarks Act*, s 2.
- 22 But on the challenges of developing and maintaining these linkages, see Estelee Biénabe & Delphine Marie-Vivien, "Institutionalizing Geographical Indications in Southern Countries: Lessons Learnt from Basmati and Rooibos" (2017) *World Devel* 58.
- 23 See Bassem Awad & Marsha Simone Cadogan, "CETA and the Future of Geographical Indications Protection in Canada" (25 May 2017), CIGI Paper No 131, online: <<https://www.cigionline.org/publications/ceta-and-future-geographical-indications-protection-canada>>.
- 24 Québec, Conseil des appellations réservées et des termes valorisants (CARTV), "PGI—Québec Ice Cider", online: <<https://cartv.gouv.qc.ca/en/reserved-designation-pgi-quebec-ice-cider>>. Note that Quebec's protection of GIs is not affiliated with the federal trademark legislation but is more of an administrative approach to the protection of GIs, its governance falling under the province's Ministry of Agriculture, Fisheries and Food.

produced under the geographical names Basel and Swiss. This also indicates that GIs are not limited to foods, wines, and spirits, but can also be pharmaceuticals, chemical products, textiles, and even home décor items.²⁵

There is no individual ownership to GI rights; they are collective rights owned by either a producer group (sometimes comprising producers, manufacturers, distributors, and industry experts) or a competent government body. Sometimes, as in the case of Quebec's provincial Protected Geographical Indication scheme,²⁶ there is a level of shared responsibility between a government body (the agricultural and forestry ministry) and the private groups that own the IP. For example, to ensure that producers comply consistently with specific standards in the production of the GI good, a public board, established under Quebec's provincial GI act, accredits and monitors the use of the GI designation on registered products.²⁷

GIs can be valuable and strong IP assets. They can diversify IP portfolios. They may boost employment opportunities in economies, and contribute to product diversification in IP-intensive firms and gross domestic product in economies.²⁸ However, GIs (the products) and GI-intensive industries (the rightsholders' businesses) can only be as strong as the domestic and international markets in which they operate.²⁹ This article focuses mainly on the legal aspects of GIs and evaluates whether blockchain distributed technologies are helpful to IP law and policy in this context. Accordingly, discussion of the full range of issues associated with GIs is outside the scope of this article.³⁰

GIs are one the few IP rights where international legal developments have facilitated either less or more expansive protection in domestic jurisdictions.³¹ Since the mid-2000s,³² GI protection has been substantially driven by IP provisions in preferential free trade agreements.³³ These provisions have

sometimes led to conflicting positions on the application of GI laws and, essentially, the types of protection available for registered products. For example, under the Free Trade and Economic Partnership between Japan and Switzerland, GIs protectable between the two jurisdictions include specific meats, dairy and dried products, and pharmaceutical and textile items.³⁴ In Canada's free trade agreement with the European Union, GIs protectable between the two parties are limited to agricultural and food-based items and wine and spirits. Therefore, while GI rights may be protectable in the TRIPS-Plus era, the goods that are registrable as GIs differ across jurisdictions.

Furthermore, some jurisdictions provide only minimal protection for GIs, while others recognize strong rights for these types of goods. What this means is that, across jurisdictions, the substantive laws pertaining to GIs can vary, thereby affecting a range of issues; foremost among them are legal certainty, the ability of products to penetrate markets successfully, and whether infringement claims can be made in global markets.³⁵

The TRIPS minimum standard on GIs stipulates that World Trade Organization (WTO) member countries should enact laws to prevent a GI name from being used to represent a product that falsely indicates that it is made in the GI jurisdiction.³⁶ Under TRIPS, GIs are also protected against unfair competition in WTO member countries.³⁷ The challenge with GI minimum standards of protection is that they do not fully protect GI products in global markets. Many trademarked goods (especially foods) use very similar names, or the same name, to refer to products of the same class as GI goods. This poses a challenge to the sustainability of GI goods, especially in new markets. The issue lies in two observations. First, GIs have been popular IP rights in Europe for centuries, and protection for goods other than wine and spirits in non-European countries became a legal phenomenon only in the 21st century.³⁸ For years, the European Union (EU) tried and failed to gain

25 See Tania Singla, "Vanity GIs: India's Legislation on Geographical Indications and the Missing Regulatory Framework" in Calboli & Wee Loon, *supra* note 5, ch 14. See also Switzerland's free trade agreement with Japan, which designates the protection of a wide array of goods, including pharmaceuticals, as GI protectable between the two countries.

26 *The Act Respecting Reserved Designations and Added-Value Claims*, CQLR c A-20.03, online: <<https://cartv.gouv.qc.ca/en/chapter-i-object-and-principles>>.

27 *Ibid*, ch II, "Conseil des appellations réservées et des termes valorisants", s 9.

28 Daniel Gervais & Irene Calboli, "Socio-Economic Aspects of Geographical indications", online: World Intellectual Property Organization <https://www.wipo.int/edocs/mdocs/geoind/en/wipo_geo_bud_15/wipo_geo_bud_15_9.pdf>; Soumya Vinayany, "Geographical Indications in India: Issues and Challenges—An Overview" (2017) 20 J World Intellect Prop 119.

29 Cadogan, "Geographical Indications, Canada", *supra* note 7.

30 For more in-depth readings, see Calboli & Wee Loon, *supra* note 5; Dev S Gangjee, "GIs Beyond Wine: Time to Rethink the Link" (2017) Intl Rev IP & Competition L 129; Dev S Gangjee, ed, *Research Handbook on Intellectual Property and Geographical Indications* (Cheltenham, UK: Edward Elgar, 2016) [Gangjee, *Research Handbook*].

31 Marsha Simone Cadogan, "In Search of Commonality in the Protection of Geographical Indications in Global Preferential Free Trade Agreements" (forthcoming, CIGI).

32 Frankel, *supra* note 8.

33 *Ibid*.

34 *Free Trade Agreement Between Switzerland and Japan*, annex X, "Geographical Indications", online: Japan, Ministry of Foreign Affairs <<https://www.mofa.go.jp/region/europe/switzerland/epa0902/annex10.pdf>>.

35 Cadogan, "Geographical Indications, Canada", *supra* note 7.

36 TRIPS, arts 22(1), (2).

37 *Ibid*.

38 See Gangjee, *Research Handbook*, *supra* note 30; Wahyu Sasongko, "Geographical Indications Protection Under the New Regulation in Indonesia" (2018) 9:4 J Soc Studies Ed Research 403.

consensus for widespread GI protection in the WTO Doha round of negotiations.³⁹ The stalled GI extension negotiations contributed to the European Union's use of regional and bilateral free trade and economic partnership agreements to safeguard their GI rights in international markets.⁴⁰ This facilitated domestic changes to GI laws in many jurisdictions including Canada,⁴¹ Singapore,⁴² and China⁴³ to make a GI protectable if the name is used by competitors to refer to products in the same product class as the GI. Sometimes, this may or may not include the translation and transliteration of the GI name.⁴⁴ However, in Canada, for example, the efficacy of GI laws domestically depends, *inter alia*, on whether GI rights conflict with existing or pending trademark rights (whether these are locally owned or owned by foreign rightsholders).⁴⁵ Therefore, it is still possible that Canada may take a restrictive approach to the recognition of GI rights. This point is examined more fully in the context of blockchain technology implications in section 4.0 below.

The second issue resulting from divergences in global GI laws is that some jurisdictions protect GIs only as certification or collective marks.⁴⁶ Such protection complies with the TRIPS minimum standards.⁴⁷ However, when GIs are recognized only as certification or collective marks and are not protected against greater infringements than those stipulated under TRIPS article 22.1, rightsholders are unable to fully differentiate and protect their goods in domestic and global markets.⁴⁸ For example, owners of certification marks cannot commercialize their products, but

must license the use of the right to licensees.⁴⁹ GI rights entitle rightsholders to commercialize products; the rights cannot be transferred, but may be used by the collective owners in the manufacturing, distribution, and sale of their products.⁵⁰ Certification marks are forms of trademarks with 10 years of protection, which is renewable thereafter. GIs are usually indefinite rights.⁵¹ However, some jurisdictions, such as Canada, allow GI rights to be cancelled if they become generic,⁵² or possibly challenged on grounds of non-use if they are not used for a period of time.⁵³

Furthermore, once the *Canada–United States–Mexico Agreement* (CUSMA) is ratified, the agreement may facilitate challenges by United States' trademark interests against protected GIs in the Canadian market.⁵⁴ (Under the *North American Free Trade Agreement*, the predecessor to CUSMA, only EU-based products are protected.) The United States' restrictive position on GIs is clearly reflected in CUSMA.⁵⁵ For example, the agreement includes specific provisions for GI cancellation and opposition, including on grounds of genericity with names used in the host country's jurisdiction. Interestingly, this stipulation runs counter to GI rules found in EU-style GI provisions.⁵⁶ Some jurisdictions still have minimal or restrictive GI protection laws. When a GI rightsholder's major consumer market is in one of these jurisdictions, there is a limit on how profitable the rightsholder's product can be in these markets. For example, the United States has restrictive rights for non-wine and spirit GIs, limiting recognition to certification and

- 39 World Trade Organization, Issues Related to the Extension of Protection for Geographical Indications Provided for in Article 23, WT/GC/W/633, 21 April 2011, online: WTO <https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/5_2_wtgcw633_e.pdf>.
- 40 Frankel, *supra* note 8.
- 41 *The Comprehensive Economic Trade Agreement Between the European Union and Canada*, online: <<https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/ceta-aecg/text-texte/20-A.aspx?lang=eng#a>> [CETA].
- 42 *The Free Trade Agreement Between the European Union and Singapore*, annex 7, "Geographical Indications", online: <https://eur-lex.europa.eu/resource.html?uri=cellar:04c776da-4322-11e8-a9f4-01aa75ed71a1.0003.02/DOC_8&format=PDF#page=17>.
- 43 *Free Trade Agreement Between the European Union and South Korea*, online: <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2011:127:FULL&from=EN>>.
- 44 In the context of GIs, translation refers to the interpretation of a GI name in a different language. For example, "Prosciutto di Parma" or "Jambon de Parme" to refer to Parma Ham. Transliteration refers to the use of the closest possible letters or word to refer to GIs.
- 45 *Trademarks Act*, s 11.11(4).
- 46 See *Trademarks Act*, s 2, on the definitions of "certification" and "collective marks." See also Teresa Scassa, *Canadian Trademark Law*, 2nd ed (Toronto: LexisNexis, 2015).
- 47 See generally TRIPS, art 22.
- 48 Marsha A Echols, *Geographical Indications for Food Products: Legal and Regulatory Perspectives*, 2nd ed (Alphen aan de Rijn, Netherlands: Wolters Kluwer, 2016).
- 49 *Trademarks Act*, s 2.
- 50 Giovanni Belletti et al, "Geographical Indications, Public Goods, and Sustainable Development: The Roles of Actors' Strategies and Public Policies" (2017) 98 *World Dev* 45.
- 51 See, for example, the European Commission's regulation on the protection of GIs in the European Union, Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on Quality Schemes for Agricultural Products and Foodstuffs, online: <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1151&from=EN>>.
- 52 *Trademarks Act*, s 11.21(2).
- 53 The legislation is not clear on whether the non-use limit of three years that applies to trademarks also applies to GIs. This may need to be decided on a case-by-case basis.
- 54 Marsha Simone Cadogan, "How Canada Should Approach Geographical Indications in Trade Negotiations with the United States and Mexico" (25 July 2017), CIGI series on NAFTA 2.0, online: <<https://www.cigionline.org/articles/coming-fight-over-peaches-and-mangoes-nafta-talks>>.
- 55 *Canada–United States–Mexico Agreement*, art 20.21, "Grounds for Denial, Opposition and Cancellation", online: <<https://www.international.gc.ca/trade-commerce/assets/pdfs/agreements-accords/cusma-aceum/r-cusma-20.pdf>>.
- 56 As used in this article, European-style GI agreements refer to either EU-initiated or EU-modelled GI rules in preferential free trade agreements that favour expansive rights for GI designations. These rights include indefinite protection for rightsholders, the non-cancellation of GIs, and the clawback of well-known product names for use by EU producers. For a detailed discussion of EU-based GI rights and their implications under CETA, see Awad & Cadogan, *supra* note 23.

collective marks. In this context, foreign GI rightsholders are only able to register their products as certification marks, collective marks, or trademarks, but not as GIs. Therefore, the protection is restricted to what is recognized as protectable under the US *Lanham Act*⁵⁷ or under common-law rules.⁵⁸

4.0 Whether Blockchains Are Useful in the Protection of GI Rights

There are specific features of blockchain technology that may be useful in the protection and enforcement of GI rights. However, because conflicting international approaches inform the substantive aspects of GI laws, the impact of blockchain technology in this area is limited. The prospects and limits of the technology's integration with GI-based industries are discussed below.

One of the appealing aspects of the blockchain protocol is its ability to build and show transparency in supply chains. The technology's time-stamped feature, and the professed immutability⁵⁹ of each block along the chain, helps to validate the authenticity of consumer goods. A practical application of how this may work is illustrated by work done by the Provenance Project, a blockchain company that uses its technology to create a "digital 'passport' that proves authenticity (is this product what it claims to be?) and origin ... creating an auditable record of the journey behind all physical products."⁶⁰ The company used its platform in a pilot project with Indonesia's tuna fish industry to establish provenance along its supply chain.⁶¹ In this context, tuna fish farmers used text messages to communicate relevant data on each catch to suppliers, which were then recorded and stored on a blockchain. By using smartphones, consumers could then access origin and traceability information about the catching, harvesting, sale, and distribution of the tuna. In another example, a Canadian-based business, Bridgehead Coffee, is using blockchain technologies to prove the authenticity of its coffee beans to consumers,⁶² which it sources directly from farmers in developing countries. The idea is to build transparency in consumer markets by proving that Bridgehead coffee beans are genuinely fair trade and organic.

Blockchain technology applies to GIs as follows. GIs are place-based goods whose legal rights emanate from strong connections

between the product and its place of origin.⁶³ Blockchain protocols may help to authenticate the origin of GI goods and establish traceability along the products' supply chain. This potential relationship between the technology and GIs relates to the governance of GI industries. As Ganne explains in the context of brand counterfeits, "a brand owner using blockchain technology to record history of its products could ... inform customs and enforcement agencies that its products include crypto-embedded tag linked to blockchain that proves its origin."⁶⁴

4.1 Proving the Origin of GI Products

Blockchain technology is potentially useful in highlighting and positioning the value of GI designations by its ability to verify the authenticity of products. That is, blockchain can prove that a GI product originates from the place from which it claims its distinct reputational, quality, or characteristic, which is the GI-designated territory. Blockchain can also be used to convey and confirm product characteristics to consumers, thereby informing product choices.⁶⁵ For example, Quebec Ice Cider PGI⁶⁶ rightsholders could potentially use blockchain technologies to record data about the processing stages and distribution channels involved in transforming selected Quebec apples into distinctive-tasting commercial ice cider. This stamp of authenticity creates transparency in the ice cider value chain and may build brand loyalty in consumer markets.⁶⁷ By authenticating GI product supply chains, blockchain technologies may be beneficial to GI-intensive industries whose market share is substantially influenced by proof of provenance; that is, whereby customers are influenced to purchase goods whose quality or other reputational characteristics can be proven. Therefore, blockchain may help to reduce the prevalence or popularity of GI counterfeits in some markets, if consumers have strong associations with the provenance of GI goods.

4.2 Compliance with Product Specification Within Producer Groups

For GI industries, the ability to help rightsholders prove the origin of their products is the most appealing and interesting aspect of blockchain technology. Related to this point is the potential usefulness of the technology in ensuring that all producers who use the GI designation comply with product specification requirements

57 *Trademark Act of 1946*, 15 USC § 1051 [*Lanham Act*]. See Christopher Haight Farley, "Looking Beyond the Known Story: How the Prehistory of Protection of Geographical Indications in the Americas Provides an Alternate Approach" in Calboli & Wee Loon, *supra* note 5, ch 9.

58 *Ibid.*

59 On immutability challenges in blockchain, see Carol Inoue Dick et al, "Blockchain Technology and Electricity Wholesale Markets: Expert Insights on Potentials and Challenges for OTC Trading in Europe" (2019) 12:5 *Energies* 832.

60 Provenance, "Blockchain: The Solution for Transparency in Product Supply Chains", online: <<https://www.provenance.org/whitepaper>>.

61 *Ibid.*

62 Provenance, "A Race to the Top: Bridgehead Coffee Is Reaching for Robust Transparency" (2 July 2019), online: <<https://www.provenance.org/news/people/a-race-to-the-top-bridgehead-coffee-is-reaching-for-robust-transparency>>.

63 Sometimes the relationship can be based on a questionable linkage between the GI goods and their place of origin. See Haiyan Zheng, "A Unique Type of Cocktail: Protection of Geographical Indications In China" in Calboli & Wee Loon, *supra* note 5, ch 16.

64 Emmanuel Ganne, *Can Blockchain Revolutionize International Trade?* (Geneva: World Trade Organization, 2018) at 66.

65 Bhavya Bhandari, "Supply Chain Management, Blockchains and Smart Contracts" (19 July 2018), online: SSRN <<https://ssrn.com/abstract=3204297>>.

66 Quebec's provincial GI legislation is an administrative measure governed by its Ministry of Agriculture, Fisheries and Food; see *supra* note 24.

67 Amir Khoury, "Brand Loyalty and Loyalty of Brands: A Symbiotic Relationship" (2014) 32:2 *J L Comm* 173.

mandated by their organization. “Product specification” refers to regulations created by a GI producer group to ensure that each product produced by, or related to, the GI designation is manufactured according to set rules and guidelines.⁶⁸ For example, in the European Commission’s GI regulation, to be registered as GIs products must “comply with a specification which shall include at least ... a description of the product, including the raw materials, if appropriate, as well as the principal physical, chemical, microbiological or organoleptic characteristics of the product.”⁶⁹ In effect, a producer is not allowed to knowingly use the GI designation on its product unless it has complied with all the processing requirements concerning the way in which the product is produced. The reason product specification is relevant to GI rights is that when one set of rules is followed by all who use the GI designation on their products, the specification builds on, and enables consistency in GI end products (this may be in taste, appearance, or effect on users).

Internationally, one of the main governance challenges of many GI industries is how to curb incidences of loose connection between the product and the specification that established the GI product. For example, the city of Varanasi in northern India is the home of a popular GI-designated product called Banarasi saree, a silk, hand-loomed garment worn on festive occasions, including by Indian brides during wedding ceremonies.⁷⁰ Competition from cheap counterfeit sarees from China has led some Banarasi saree producers to purchase and use the cheaper synthetic fabric in making sarees, which are then labelled as authentic GI silk Banarasi sarees.⁷¹ In China, concerns over disconnections between oranges designated as GIs and compliance codes that should have been used to produce the product indicate that some GI products may not always be as distinctive as suggested by their labels.⁷²

There may be a role for blockchain technologies in the administration and monitoring of compliance procedures

within GI producer groups. The technology can be useful in recording and tracking product specification compliance among GI producers. This may include a requirement that each producer complete a product specification compliance checklist by using a specific smartphone application, which then submits information in encrypted format to a blockchain platform, which in turn produces and keeps specific records and tags of each transaction. If compliance with GI product specifications can be verified by blockchain technologies, it may complement existing efforts to build transparency along GI supply chains.

4.3 Addressing GI Counterfeits Through Blockchain Technologies: Issues

What happens if blockchain technology does what it says it will do—record and show GI provenance, have no foreseeable interoperability⁷³ challenges, and have minimal threats to its immutability? How useful blockchain technology will be in effectively mitigating GI counterfeits depends on the GI law of the jurisdiction in which the infringement occurs. For example, FETA cheese GI⁷⁴ rightsholders (whose origin is Greece) who use blockchain technologies to validate the authenticity of their products and to prevent the selling of counterfeit cheese in their consumer markets will find that infringement is subject to different receptions in at least three different jurisdictions. Because of continued opposition to the expansion of non-wine and spirit GI rights in the United States,⁷⁵ it will be very difficult to prove infringement outside the parameters of TRIPS article 22.2. Therefore, if the FETA name is used by a US cheese producer, but the true origin of the product is indicated as the United States, and the customer is not misled, there will be no infringement.⁷⁶ In Canada, there will likely be no infringement if the Canadian producer uses qualifiers (such as “kind,” “type,” or “style of”) to indicate that the cheese is not directly associated with Greece’s cheese, and the label clearly shows that the

68 See, for example, *Foundation for the Protection of the Traditional Cheese of Cyprus Named Halloumi v EUIPO*, Case C-569/18, in which the Court of Justice for the European Union was asked to determine the product specifications for Mozzarella di Bufala Campana (Mozzarella cheese), and whether product specifications created by the cheese producer group should also take into account national rules on geographical indications, which require GIs to be produced exclusively within certain areas. The court ruled that product specifications created by GI producer groups cannot preclude national laws on GIs.

69 EU No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on Quality Schemes for Agricultural Products and Foodstuffs, art 7(1)b.

70 See Yogesh Paian and Tania Singla, “‘Vanity GIs’: India’s Legislation on Geographical Indications and the Missing Regulatory Framework” in Calboli & Wee Loon, *supra* note 5, ch 14.

71 *Ibid.*

72 Xing Zhao et al, “The Effectiveness of Contemporary Geographical Indications (GIs) Schemes in Enhancing the Quality of Chinese Agri-Foods—Experiences from the Field” (2014) 36 J Rural S 77.

73 Blockchain interoperability deals with how scalable the technology is, the types of transactions it can handle, its ability to process and transmit varying types of information accurately across different systems, and how well different stakeholders are integrated into the platform. See Claudio Lima et al, “Developing Open and Interoperable DLT Blockchain Standards” (2018) 51:11 Computer 106.

74 FETA is a protected GI from Greece and is protected to a different extent globally. See European Commission, Agriculture and Rural Development, DOOR, online: <<http://ec.europa.eu/agriculture/quality/door/registeredName.html?denominationId=876>>.

75 For a summary of the United States’ position on non-wine and spirit GIs, see the recent submission by the United States to the World Intellectual Property Organization’s Standing Committee on the Law of Trademarks, Industrial Designs and Geographical Indications, “Proposal by the Delegation of the United States”, Forty-First Session, Geneva 8–11 April 2019, online: <https://www.wipo.int/edocs/mdocs/sct/en/sct_41/sct_41_7.pdf>.

76 *Lanham Act*, §§ 2, 4.

product is produced in Canada.⁷⁷ This orientation toward GIs, specifically in cases concerning certain foods including cheeses, results from the economic partnership agreement between Canada and the European Union.⁷⁸ The legal outcome would be very different for a Greek FETA GI rightsholder attempting to eliminate counterfeits in the Caribbean. If a cheese or dairy producer in the Caribbean were to use the name FETA on its product, with labelling that indicates some differentiation from the Greece base product, a case for GI infringement can still be made. This is based on a robust provision in the free trade agreement between the European Union and CARIFORUM⁷⁹ countries that prevents CARIFORUM countries from using GI names, even if the true place of origin is noted on the packaging, and prevents qualifying words such as “like” or “imitation of” from being used.⁸⁰ In this context, the provenance abilities of blockchains (if the technology itself is effective and if it is in fact immutable) may help to support infringement claims prior to and even during litigation.

When differences in GI rights exist between jurisdictions, blockchain technologies have little or no impact on the protection of GI-based rights across jurisdictions. One concern, highlighted in section 2.0 above, relates to differences in the parameters of definitions of GIs between jurisdictions. Under Canada’s *Trademarks Act*, GIs are identified as agricultural and food-based products, or wine and spirits.⁸¹ In other countries such as India and Switzerland,⁸² GIs can be agricultural goods, natural goods, manufactured goods, or pharmaceutical products, which opens a wide range of products to GI registrability. While blockchain technology may be able to identify a product as infringing based on its non-conformity to a blockchain tagging system, if the product is not legally identifiable as a GI in the host country, the technology provides no extra benefit.

When GI protection is less favourable in foreign jurisdictions, a diversified approach to IP protection is recommended to mitigate

losses. If GI rightsholders can register their rights as trademarks in GI restrictive regimes, a level of protection is provided against trademark-related infringements in these markets. In this context, blockchain technologies may be useful in infringement claims to provide proof of ownership and authenticity of products.

4.4 Blockchain Technologies as a Differentiated Platform for Registering Geographical Indications

Another relevant issue is how extensive the use of the technology should be in the law and governance of GIs. In terms of blockchain case studies and actual use of the technology in the IP realm, a few blockchain-based enterprises are using the technology to offer trademark and copyright registration platforms to IP owners.⁸³ It is therefore not impossible for GI rights to be “registered” on blockchains. I refer to this potential intersection as a differentiated platform because it exists outside the mainstream, traditional format of registering IP rights.

The real concern is the implications of such registration for rightsholders, for the development of GI protection and enforcement rights globally, and for the advancement of GIs as strong IP assets in international markets. One substantial difference between GIs and most other types of IP rights is that designations do well when there is involvement of or partnerships with government bodies.⁸⁴ These public-private relationships may be in the form of collaborations on product diversification initiatives, building service-oriented initiatives such as health tourism through partnerships with specific government organizations,⁸⁵ or promoting provinces, cities, or towns by affiliating the GI product with its place of origin.⁸⁶ GI registrations performed using blockchain technology facilitate differentiated platforms for the protection of GI rights. For the purposes of this article, a “differentiated platform” is defined as a framework created to achieve an objective, or some aspects of an objective, that is similar to that of a mainstream framework, through the use of very different

77 *Comprehensive Economic and Free Trade Partnership Agreement Between European Union and Canada*, ch 20.21, “Intellectual Property”, online: <<https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/ceta-aecg/text-texte/20.aspx?lang=eng>>. Furthermore, the “no-infringement ground” applies only if the Canadian FETA manufacturer was in business prior to 18 October 2013. A five-year transitional period also applies from the ratification of the agreement. In effect, this covers the Canadian user of the FETA cheese name (with qualifications specified in the text above) until 2022.

78 Awad & Cadogan, *supra* note 23.

79 CARIFORUM is a regional trading bloc of the following countries: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St Lucia, St Vincent and the Grenadines, St Kitts and Nevis, Suriname, and Trinidad and Tobago.

80 *Economic Partnership Agreement Between the CARIFORUM States and the European Union*, art 145(3), online: <[https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:22008A1030\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:22008A1030(01)&from=EN)>.

81 *Trademarks Act*, s 2.

82 See, for example, India’s GI legislation, *The Geographical Indications of Goods (Registration and Protection) Act, 1999*, No 48, online: <http://www.ipindia.nic.in/writereaddata/Portal/IPOAct/1_49_1_gi-act-1999.pdf>.

83 See Marsha Simone Cadogan, “How Blockchain Is Changing the Trademark Space” (30 August 2019), *UnscrIPted: Views on Canadian Intellectual Property*, online: Intellectual Property Institute of Canada <<https://ipic.ca/english/blog/how-blockchain-technology-is-changing-the-trademark-space-2019-08-30.htm>> [Cadogan, “How Blockchain Is Changing the Trademark Space”].

84 For an insightful discussion on the role of the governance in GI industries, see Irene Calboli & Delphine Marie-Vivien, “One Size Does Not Fit All: The Roles of the State and the Private Sector in the Governing Framework of Geographical Indications” in Margaret Chon, ed, *The Cambridge Handbook of Public-Private Partnerships, Intellectual Property Governance, and Sustainable Development* (Cambridge, UK: Cambridge University Press, 2018) ch 14.

85 See Tamara Bubalo et al, “Geographical Indications of Origin in Serbia: Where the Past Fuels the Future” (27 April 2018), *CEE Legal Matters*, online: <<https://ceelegalmatters.com/serbia/8439-geographical-indications-of-origin-in-serbia-where-the-past-fuels-the-future>>.

86 For example, Canadian Cow Cheese from Quebec is a registered GI designation based on the interconnections between the cow, the region, and the processing of the milk to produce the cheese. See CARTV, “Designation of Specificity for Canadian Cow Cheese”, online: <<https://www.cartv.gouv.qc.ca/en/designation-specificity-fromage-vache-race-canadienne-canadienne-cow-cheese>>.

means. Furthermore, there is little or no connection between the differentiated platform and the mainstream legal framework. In the context of IP rights governance and administration, the relationship between blockchain enterprises that register IP, and mainstream ways of registering IP (that is, by lawyers, trademark agents, and IP offices), shows the workings of a differentiated platform. While IP registrations on blockchains are less costly than those facilitated by lawyers and IP offices,⁸⁷ without adequate oversight, the system may complicate an already conflicting⁸⁸ area of law.

One concern that relates to the protection of GI rightsholders' interest on the blockchain is the degree of interface between private blockchain enterprises and IP and trade regulatory bodies such as national intellectual property offices, the World Intellectual Property Organization (WIPO), or WTO platforms and resources. One of the objectives of blockchain is to replace the use of middle parties in transactions between buyers and sellers, service providers and users, and similar parties.⁸⁹ Because of their role in governing IP rules and facilitating improvements to IP frameworks, national and international IP organizations are still relevant to the 21st-century way of doing business. A limited or complete absence of tangible connections between IP regulatory bodies and blockchain platforms may result in a compromised level of GI protection in domestic and global markets. GI laws are evolving. For example, the European Union recently announced plans to join the *Geneva Act of the Lisbon Agreement on Appellations of Origin and Geographical Indications*. This treaty cements a level of permanence of GI names in consumer markets by preventing competitors from using GI names on other products and prohibiting the names from becoming generic.⁹⁰

How will this affect GI rightsholders seeking entry into EU markets once this treaty is ratified in EU countries? Canada is not a party to the treaty, but will new requirements be in place that go beyond CETA-style EU commitments for Canadian GI rightsholders?⁹¹ How will blockchain technologies deal with these issues of differences in GI rights globally? The timeliness and frequency with which GI laws and practice notes are updated on blockchain platforms, and how accurate this information is, speaks volumes about how effective the linkage between blockchain technology and industry can be. The technology needs to accurately reflect the impact of a national GI registration for a rightsholder who seeks protection in diverse foreign markets, where different levels of GI protection have an impact on the sustainability of the product, and the rightsholders' market share in foreign markets. Furthermore, how will the technology handle GI

maintenance or renewals, when most jurisdictions, such as Canada and the European Union, do not require GI renewals, but some jurisdictions, such as India and China,⁹² do? How does this work for a rightsholder who wants to register GIs in multiple jurisdictions that differ in their rules on renewals? These are legal and interoperability concerns that demand consideration based on the potential impact on rightsholders. In addition, because the technology is likely to compete with mainstream mechanisms for protecting IP, the concern includes the entire IP community.

4.5 Geographical Indications and Smart Contracts: Connections and Concerns

Smart contracts are automated applications within the blockchain platform that perform specific functions or tasks if certain conditions are met. These functions or tasks include the payment of funds and the delivery of services such as electricity, health-care transactions, and similar tasks, as contemplated by the architecture of the platform.⁹³ They are termed "smart" because their automated function enables the conclusion of agreements on specific terms and conditions, without the use of legal representatives.

Smart contracts can be used either within GI producer groups or between GI producer groups and external distributors or other related stakeholders. For example, it may be possible for smart contracts to execute and conclude the terms on which products are to be transferred from GI farmers to food processors, thereby making decisions on what terms govern the release of funds between different producers along the supply chain. The architecture may also be potentially useful in transnational settings, by completing transactions between GI suppliers and external distributors across regions or countries, whereby funds are transferred to suppliers based on the receipt, shipment, or related arrangement as stipulated in the encoded agreement. These are forecasted possibilities that, according to my research, are not yet being done in industry but that are not impossible.

There are three concerns associated with the identified connections noted above. The first relates to the type of terms that would be specified in GI-related smart contracts, and whether these fairly represent the interests of producers. This is especially relevant if the producer is a start-up, with little or no knowledge or experience in the legal aspects of GI-based industries, or in the issues that may negatively affect its ability to generate revenue (in the short and long term). Since the process is automated, there is no negotiation of

87 See Cadogan, "How Blockchain Is Changing the Trademark Space", *supra* note 83.

88 See Daniel Gervais, "Irreconcilable Differences? The Geneva Act of the Lisbon Agreement and the Common Law" (11 February 2016), online: SSRN <<https://ssrn.com/abstract=2717287>>.

89 Daniel Macrinici, Cristian Cartofeanu & Shang Gao, "Smart Contract Applications Within Blockchain Technology: A Systematic Mapping Study" (2018) 35:8 *Telematics & Informatics* 2337.

90 *Geneva Act of the Lisbon Agreement on Appellations of Origin and Geographical Indications*, arts 11(2), 12, online: <https://www.wipo.int/edocs/lexdocs/treaties/en/lisbon/trt_lisbon_009en.pdf>.

91 On GI concerns raised by CETA in Canada, see Awad & Cadogan, *supra* note 23.

92 Depending on which Chinese legislation the GI is registered under.

93 Tatiana Cutts, "Smart Contract and the Consumer" (5 April 2019), LSE Legal Studies Working Paper No 1/2019, online: SSRN <<https://ssrn.com/abstract=3354272>>; Jens Frankenreiter, "The Limits of Smart Contracts" (1 February 2019), online: SSRN <<https://ssrn.com/abstract=3328464>>. For an example of how this works in practice, see how smart contracts are used to facilitate the shipment of large cargo in specific regions: Biz4intellia, online: <<https://www.biz4intellia.com/smart-contract-solutions/>>.

terms, and parties are bound by the configured automated terms, as a means of executing the contract.

The second concern is how to approach problems when disputes arise from the execution of a smart contract between parties. In contract law, parties with power advantages often favour terms that benefit their position more than that of the other parties.⁹⁴ If parties to a GI smart contract have unequal bargaining power, the contractual terms, including on dispute resolution, may be more favourable to the more powerful party. These terms may include the choice of venue in resolving disputes, and the resolution of disputes outside the court system. In this context, disintermediation, noted in section 3.0 above as the process and ability of a mechanism to perform a task without third parties, may have a negative impact on the integrity of the IP system.

The lure of a smart contract lies in its ability to perform a task, or complex operations, at a lower cost than the more conventional route of using legal representatives. Cost may be a plus factor for GI smart contracts if disputes are fairly resolved. However, when dispute resolution problems arise, there is no guarantee of how and whether they can be successfully resolved, and whether third-party intervention by a court can be contemplated and achieved. Another concern is whether, as a legally binding mechanism that arose outside the legal system, smart contracts with their promised benefits of “privacy” and low cost present an opportunity cost for the availability of legal precedence on GI conflicts to the legal (and the broader) community. Dispute resolution issues that arise on the blockchain and are dealt with entirely through private means may not be captured by legal databases or archived and analytically discussed on the Internet. This shortfall affects the ability of the legal community and GI stakeholders to fully understand how the law is developing in this area, thereby undermining the creation and development of legal precedents.

The final concern with the use of GI smart contracts is a technical challenge associated with the scalability of the technology in terms of its accessibility by GI producers across different countries and sectors. GIs are an EU construct that has been steadily gaining in popularity internationally, especially as it relates to foods, since the mid-2000s.⁹⁵ Compared with the wine and spirit industry, food-based GI industries are relatively new to many jurisdictions, including Canada, outside the EU. Connecting complex technology with these industries on a large scale internationally will take time, and is bound to experience some problems. GI start-ups, or even established commodity producers in emerging and developed economies, may have an interest in automated platforms, but there may be no provider of the blockchain service or limited technological infrastructure to sustainably utilize the platforms. This is likely to be a substantial concern for GI industries located in countries with strained information, communication, and technology infrastructure, or in communities within Canada where there are challenges accessing Wi-Fi on smartphones in specific areas.

5.0 The Way Ahead

This analysis leads to the question of what role blockchain technologies should play in the law and governance of GI industries. The imperative concern is how to approach these relationships, and the type of oversight available to ensure minimal problems or abuses in the area. Any answer to this question should incorporate international platforms that deal with the development of GI laws, such as the World Intellectual Property Organization Standing Committee on the Law of Trademarks, Industrial Designs and Geographical Indications (WIPO SCT). The WIPO SCT is a forum that discusses, suggests, and makes rules on many critical issues in GIs, including on the protection of GI domain names in e-commerce environments. It is an existing platform that is useful to WTO members, including Canada, and interested stakeholders, to make recommendations and construct rules on how technologies interact with GIs, with specific reference to safeguarding the interest of GI rightsholders.

Also relevant is developing standard setting in the area of GIs and blockchain technologies. This is a broader engagement and is likely to work better as more diverse stakeholders are involved in the process. In this context, standard setting goes beyond company- or industry-specific standards on GIs, and therefore needs participation from GI entrepreneurs, the technology community, privacy experts, policy makers, lawyers, and academics.

Depending on how constructive these dialogues are, the recommendations should be helpful in creating workable foundations for the use of blockchain technologies (regardless of how limited the actual interaction is) in GI-based industries.

6.0 Conclusion

The use of blockchain technologies to support transparency and provenance claims along GI supply chains is helpful to GI industries. There are also potential benefits of blockchain technology in securing greater compliance within GI producer groups, and in the use of smart contracts in certain conditions. Until greater consistency in the protection of GI goods is achieved (there is still not enough support for this at the international level), blockchain technologies are not the most ideal solution to one of GI industries' biggest problems—counterfeit challenges, and the inability to protect products effectively in foreign markets because of non-recognition or inadequate recognition of GI rights. The technology may complement existing GI enforcement initiatives. In terms of proving GI infringements where the designation is not legally recognized as a GI in the alleged infringing jurisdiction, the solution lies outside the technology—in reformed approaches to GI laws and better balancing of legal perspectives on GIs against more established trademark rights. These are still early days in the use of blockchain in the IP rights realm. Standards will be helpful in setting governance parameters for the technology's interaction with GI laws and industries. Furthermore, framing rules on these issues at the international level will be useful in shaping how blockchain technologies interact with GI-based industries.

94 Benjamin E Hermalin, Avery W Katz & Richard Craswell, “The Law and Economics of Contracts” (12 June 2006), Columbia Law and Economics Working Paper No 296, online: SSRN <<https://ssrn.com/abstract=907678>>.

95 See Awad & Cadogan, *supra* note 23.