

RULES AS CODE AND THE INTERPRETATIVE ROLE OF THE JUDICIARY

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ABSTRACT

Interest in Rules as Code (“RaC”), that is, the publication of legislation in a machine-consumable form, has grown significantly in recent years as Australia looks toward greater adoption of a ‘digital government’ philosophy, but while vast literature exists showing its viability in relatively straightforward cases, little has considered the constitutional and jurisprudential issues associated with various methods of development and publication beyond categorising RaC as inherently aligned with the theory of legal formalism. The present article argues that approaching RaC from a strictly formalist or non-formalist perspective is unhelpful both in considering and developing RaC applications in public contexts. This was tested through the development of an application which applies provisions of the *National Consumer Credit Protection Act 2009* (Cth), during the process of which it was determined that neither a strict formalist or non-formalist approach could adequately represent the plain-text legislation. An alternative approach is put forward which analogises the process of developing and publishing RaC to multilingual translation, and it is argued that this approach provides more valuable and relevant lessons for lawmakers and programmers considering RaC going forward.

I INTRODUCTION

This article seeks to explore how Rules as Code (“RaC”) might operate within Australia in a way which is compatible with the interpretative role of the judiciary. In recent years, efforts to move further toward digital government in the form of machine-consumable legislation¹ have increased globally, though little response has been offered to sceptics wary of how RaC might impact upon the constitutional powers of the judiciary. This article investigates how RaC might inadvertently and harmfully extend

¹ See James Mohun and Alex Roberts, ‘Cracking the Code: Rulemaking for Humans and Machines’ (Observatory of Public Sector Innovation, Organisation for Economic Co-operation and Development, 27 May 2020) 58–59.

the judicial power of interpretation to programmers and discourage the drafting of discretionary clauses in order to accommodate digital conversion. It argues that approaching RaC from a strictly legal formalist or non-formalist perspective is ineffective. To this end, methods of encoding ambiguous clauses in Chapter III of the *National Consumer Credit Protection Act* (“*National Credit Act*”)² are tested and evaluated with particular focus on the variations between formalist and non-formalist interpretative approaches. Section II offers a broad overview of the topic, acknowledging relevant literatures, while Section III outlines the methodologies attempted. Section IV summarises and evaluates the project’s findings throughout the development of resultant application³ and shows that reducing RaC to a strictly formalist or non-formalist tool is not possible. Section V proposes that, in light of the project’s findings, alternative approaches might be better suited than that of the formalist vs non-formalist debate initially discussed, focussing in particular on the lessons RaC advocates might learn from the legislative drafting process seen in multilingual jurisdictions. Ultimately, this article seeks to address the question: is there a method with which to code ambiguous legal terms in a way which respects the interpretative role of the judiciary?

II LITERATURE REVIEW

This section argues that while the relevant literatures show that the development and publication of RaC is a necessary evolution in light of the financial and legal pitfalls of individual commercial solutions, there are jurisprudential and constitutional issues surrounding its potential implementation in public contexts. Subsection A explores how current and historical endeavours within the field of computational law have grown and provided valuable lessons for a future implementation of RaC. Subsection B considers one of the key concerns arising from RaC with regard to the interpretative nature of the judiciary, this being the inherence of algorithms to align with legal formalism. Finally, Subsection C considers the act of interpreting and converting legislation to code with regards to the separation of

² 2009 (Cth).

³ Accessible at Nicholas Godfrey, *Rules as Code - Banking Compliance* (2020) <https://github.com/NicGodfrey/Rules-As-Code_Banking-Compliance>.

powers, drawing analogies to multilingual legislation. For these purposes, and for the remainder of the paper, it is acknowledged that while in practice, Australia does not fully adhere to a complete separation of powers, the generally adopted position among the relevant literature is one which considers this separation in full, and thus, it is with this broader theoretical separation that this article generally concerns itself.

A Computational Law

Generally, legal systems have historically and inherently displayed varying levels of computational potential⁴ given reliance upon conditional statements.⁵ The earliest preserved legal code, the Code of Ur-Nammu, was made up almost entirely of ‘If’ statements,⁶ while co-father of calculus, Gottfried Leibniz, famously pursued a precise method of interacting with the law in computational terms.⁷ Late 20th Century attempts at realising this potential through development of a normalised process of legal drafting, such as that hypothesised by Allen & Engholm⁸, highlighted syntactic difficulties in the task and could be considered the origins of the field now known as computational law.⁹

In the 1980s, efforts such as that of Sergot et al.¹⁰ helped push the field forward by taking the theory of their predecessors and converting an actual piece of legislation, the *British Nationality Act*,¹¹ into code through standardised syntax and logical relationships. There, some initial discrepancies between the technical capabilities of code and semiotics were initially highlighted, for example, the tendency of a

⁴ That is, given a set of inputs (facts), an output (decision) can be determined according to pre-set rules.

⁵ Systems such as the common law, of course, have less computational potential than, for example, statute.

⁶ Martha T Roth and Harry A Hoffner, *Law Collections from Mesopotamia and Asia Minor* (Society of Biblical Literature, 2nd ed, 1997) 13–22.

⁷ Stephen Wolfram, ‘Computational Law, Symbolic Discourse, and the AI Constitution’ in *Ethics of Artificial Intelligence* (Oxford University Press, 2020) 155, 155.

⁸ Layman Allen and C Engholm, ‘Normalized Legal Drafting and the Query Method’ (1978) 29 *Journal of Legal Education* 380.

⁹ See, eg, Kevin D Ashley, *Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age* (Cambridge University Press, 2017) 39–40, 44–47 (‘*Artificial Intelligence and Legal Analytics*’).

¹⁰ Marek Sergot et al, ‘The British Nationality Act as a Logic Program’ (1986) 29 *Communications of the ACM* 370; See also Allen Hustler, *Programming Law in Logic* (Research Report No CS-82-13, May 1982)

<http://www.softwarepreservation.org/projects/prolog/waterloo/doc/Hustler-Programming_Law_in_Logic-CS_82_13_Waterloo-1982.pdf>; Duncan C MacRae, ‘User Control Knowledge in a Tax Consulting System’ (1986) 19(17) *IFAC Proceedings Volumes* 193.

¹¹ 1981 (UK).

machine to assume an unanswered Boolean query to have a ‘false’ value by default conflicting with the natural human understanding of ‘unknown’.¹² Further, Leith critiques the logic used by Sergo et al. in their conversion,¹³ and questions whether a purely logical reading of the legislation is truly representative of the judiciary’s interpretation process,¹⁴ though the extra-curial words of French CJ would indicate this concern is unfounded in Australia.¹⁵ Despite such critiques, Sergo et al. argued that their experiment proved a success within its limited scope, serving as an example for future attempts at converting legal texts and processes into logic.¹⁶ Genesereth notes that Sergo et al.’s limitations became manageable by the turn of the century,¹⁷ but raises broader and more inherent issues in the notion of RaC, such as the lack of interpretative or analytical skills in a computer program,¹⁸ as well as the inherent formalist nature of algorithms.¹⁹ Genesereth’s conclusion is that despite these limitations, RaC is still ‘the next step in the evolution of the legal system’²⁰ and should be deployed in areas of law in which the aforementioned skills are not required.

Since the turn of the century, machine-executable law has been hypothesised through several methods. In pursuit of Leibniz’s envisioned computational legal framework, Wolfram²¹ advocates for a natural language approach which would involve the manual classification of objects and legal concepts,²² while courts in the United States have adopted machine-learning techniques to assist in tasks such as

¹² Sergo et al (n 11) 379–380.

¹³ Philip Leith, ‘The Rise and Fall of the Legal Expert System’ (2016) 30(3) *International Review of Law, Computers & Technology* 94, 100–101.

¹⁴ Ibid 100.

¹⁵ Robert French, ‘Statutory Interpretation and Rationality in Administrative Law’ (2015) 6–7 <<http://www.austlii.edu.au/au/journals/AIAdminLawF/2015/20.pdf>>.

¹⁶ Sergo et al (n 11) 385.

¹⁷ Michael Genesereth, ‘Computational Law: The Cop in the Backseat’ (CodeX: The Center for Legal Informatics, Stanford University, 2015) 205, 4–5 <<http://portal.acm.org/citation.cfm?doid=1165485.1165517>>.

¹⁸ Ibid 6.

¹⁹ Ibid 5–6.

²⁰ Ibid 8.

²¹ Wolfram (n 8).

²² Ibid 156–158; See also Lance A Miller, ‘Natural Language Programming: Styles, Strategies, and Contrasts’ (1981) 20(2) *IBM Systems Journal* 184 (‘Natural Language Programming’) for early explorations into Natural Language Programming.

recidivism prediction.²³ Ultimately, however, initial efforts in developing an RaC framework have operated within a deterministic ‘*If x, then y*’ logic.²⁴

Over the last decade, focus has moved from programming theoretical conversions of the law to mapping out the processes by which computational law could be practically implemented. Indeed, fragmented solutions are already being rapidly introduced particularly in the financial sector, with Juniper Research forecasting an increase from USD \$277bn to \$316bn global annual expenditure by banks on compliance and regulatory obligations between 2019 and 2024.²⁵ In light of the Hayne Royal Commission²⁶ and Westpac’s ongoing dispute with AUSTRAC,²⁷ Australia’s own compliance expenditure can be expected to face proportionally similar growth, threatening the sustainability of a non-significant portion of smaller financial services.²⁸ Beyond the financial costs however, the OECD identify a serious legal risk in a status quo which sees each individual private entities separately interpreting the law in their own ways, resulting in a variety of software solutions which make up both legal and technical ‘black boxes’ through proprietary protection and software structure respectively,²⁹ and therefore cannot

²³ See, eg, the use of the COMPAS algorithm in *Loomis v Wisconsin* 881 NW 2d 749 (Wis, 2016). See also Liu, Han-Wie, Ching-Fu Lin and Yu-Jie Chen, ‘Beyond State v. Loomis: Artificial Intelligence, Government Algorithmization, and Accountability’ (2019) 27(2) *International Journal of Law and Information Technology* 121.

²⁴ See, eg, Government Information Services, *Better Rules for Government* (Discovery Report, Department of Internal Affairs, New Zealand Government, March 2018) 21–24 <<https://www.digital.govt.nz/dmsdocument/95-better-rules-for-government-discovery-report/html,-pseudocode-and-software-code#examples-of-legislation,-pseudocode-and-software-code>>; Open Fisca, ‘From Law to Code — OpenFisca Documentation’, *Open Fisca* (Wiki) <<https://openfisca.org/doc/coding-the-legislation/index.html>>; Stanford Law School, ‘Hammurabi’, *Stanford Law School* <<https://law.stanford.edu/projects/hammurabi/>>.

²⁵ Susannah Hampton, ‘Opportunities for AI in Regtech’ (Juniper Research, September 2019) 1 <<https://www.juniperresearch.com/document-library/white-papers/opportunities-for-ai-in-regtech-whitepaper>>; Sam Smith, ‘Regtech Spending to Reach \$127 Billion by 2024, as AI Drives Cost Savings’, *Juniper Research* (24 September 2019) <[https://www.juniperresearch.com/press/press-releases/regtech-spending-to-reach-\\$127-billion-by-2024](https://www.juniperresearch.com/press/press-releases/regtech-spending-to-reach-$127-billion-by-2024)>. See also Emmanuel Schizas et al, *The Global RegTech Industry Benchmark Report* (SSRN Scholarly Paper No ID 3560811, Social Science Research Network, 30 June 2019) <<https://papers.ssrn.com/abstract=3560811>>; Mohun and Roberts (n 1) 39; Deloitte Australia, ‘Get out of Your Own Way: Unleashing Productivity’ (2014) <<https://www2.deloitte.com/au/en/pages/building-lucky-country/articles/get-out-of-your-own-way.html>> (‘Get out of Your Own Way’).

²⁶ Commonwealth, Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry, *Final Report* (2019).

²⁷ ‘Statement of Claim’, *Chief Executive Officer of the Australian Transaction Reports and Analysis Centre v Westpac Banking Corporation* (Federal Court of Australia, 20 November 2019). See also Westpac Banking Corporation, ‘Westpac Releases Findings into Austrac Statement of Claim’ (4 June 2020) for Westpac’s acknowledgement of compliance failures.

²⁸ Australian Small Business and Family Enterprise Ombudsman, Submission No 46.1 to Select Committee on Financial Technology and Regulatory Technology, Parliament of Australia, (26 June 2020) 4, 7, 10, 17.

²⁹ Yoshua Bengio, ‘Springtime for AI: The Rise of Deep Learning’ (June 2016) *Scientific American*; Montañez, Amanda, ‘Unveiling the Hidden Layers of Deep Learning’, *Scientific American* (Web Article, 20 May 2016)

be checked by external legal experts.³⁰ Indeed, such cases have arisen in the United States, in which not even the judicial figures relying on such tools in their sentencing were privy to its inner mechanisms.³¹ It is therefore no surprise that the RaC initiative is being pursued in a variety of forms worldwide,³² though such reforms carry with them risks as well.

Though an RaC framework is yet to be installed in a significant sense by any government administration, logic and data-driven legal decision-making software is being deployed both commercially and publicly at a rapid pace, providing lessons to be considered in any potential RaC implementation. Critics such as Starr,³³ Liu, Lin & Chen³⁴ and Larson et al.³⁵ highlight the potential for automated decision-making to exacerbate discriminatory biases already present in society through the use of inherently skewed data in training artificial intelligence,³⁶ and such concerns translate to rules engines via the risk of ignoring the constantly evolving nature of social norms by programming the law statically according to the norms at the time. A 2017 investigation conducted by *ProPublica* found significant racial bias in the conclusions of COMPAS,³⁷ an algorithm employed by various courts in the United States to assist judges in predicting recidivism, despite no explicit referral to race in the

<<https://blogs.scientificamerican.com/sa-visual/unveiling-the-hidden-layers-of-deep-learning/>>; Lina Zhou et al., 'A Comparison of Classification Methods for Predicting Deception in Computer-Mediated Communication' 20(4) *Journal of Management Information Systems* 139, 149; Han-Wei Liu, Ching-Fu Lin and Yu-Jie Chen, 'Beyond State v Loomis: Artificial Intelligence, Government Algorithmization and Accountability' (2019) 27(2) *International Journal of Law and Information Technology* 122, 135–136 ('Beyond State v Loomis').

³⁰ Mohun and Roberts (n 1) 21. Though not a 'Rules as Code' solution, such concerns over proprietarily 'opaque' software being relied upon for legal decision-making were realised in *Loomis v Wisconsin* 881 NW 2d 749 (Wis, 2016).

³¹ See, eg, *Loomis v Wisconsin* 881 NW 2d 749 (Wis, 2016).

³² Mohun and Roberts (n 1) 68–69. See also Government Information Services (n 25); Open Fisca, 'OpenFisca', *Open Fisca* (Wiki) <<https://openfisca.org/>>; Kompetenzzentrum Öffentliche IT [Competence Center Public IT], 'Recht Digital - Maschinenverständlich Und Automatisierbar [Digital Law - Machine-Consumable and Automatable]' <<https://www.oeffentliche-it.de/publikationen?doc=104099&title=Recht+Digital+-+Maschinenverstdlich+und+automatisierbar>>.

³³ Sonja Starr, 'Evidence-Based Sentencing and the Scientific Rationalization of Discrimination' (2014) 66(4) *Stanford Law Review* 803.

³⁴ Liu, Han-Wei, Ching-Fu Lin and Yu-Jie Chen (n 17).

³⁵ Jeff Larson et al, 'How We Analyzed the COMPAS Recidivism Algorithm', *ProPublica* (online, 23 May 2016) <<https://www.propublica.org/article/how-we-analyzed-the-compas-recidivism-algorithm>>; *ProPublica*, *COMPAS Recidivism Risk Score Data and Analysis* (Dataset, March 2020) <<https://propublica.org/dataset/dataset/compas-recidivism-risk-score-data-and-analysis>>; Julia Angwin and Jeff Larson, 'ProPublica Responds to Company's Critique of Machine Bias Story', *ProPublica* (online, 29 July 2016) <<https://www.propublica.org/article/propublica-responds-to-companys-critique-of-machine-bias-story>>.

³⁶ Starr (n 34) 836–837.

³⁷ Jeff Larson et al, (n 36); Angwin, Julia and Jeff Larson (n 36).

algorithm itself.³⁸ Such unintentional biases, scholars argue, result from the correlation of race with variables such as socioeconomic status,³⁹ a relationship which is in itself indicative of current societal norms not being appropriate foundations upon which law should be statically programmed.

B *The Formalist Nature of Code*

While literature proposing technical and social methods of implementing RaC is abundant and fast growing, there is little addressing the question of whether such developments should in fact occur from a jurisprudential perspective. As an inherent consequence of the deterministic nature of algorithms, the field of computational law naturally aligns with the theory of legal formalism,⁴⁰ a normative theory of jurisprudence encouraging strict adherence only to the law, as opposed to contextual or heuristic considerations.⁴¹ Indeed, formalism has been described numerous times as the ‘autonomous’ theory of adjudication.⁴² It is acknowledged that the theory of legal formalism is one with a wide number of varying interpretations, and thus for the purposes of this article, the facets which are common across most variations, namely a strict and technical interpretation of the law in which the judiciary is expected not to create law, but to find the ‘right’ interpretation, are considered. McIntyre corroborates concerns of RaC aligning with formalism in his critique of digital government, highlighting the dangers of discouraging judicial discretion clauses for the sake of accommodating RaC⁴³ and disparagingly

³⁸ Northpointe, ‘Practitioner’s Guide to COMPAS Core’ (Guidance, Northpointe, 19 March 2015) 29.

³⁹ Starr (n 34) 837–838.

⁴⁰ Genesereth (n 18) 5.

⁴¹ *West’s Encyclopedia of American Law* (online at 25 August 2020) ‘formalism’.

⁴² See, eg, Judge Richard A. Posner, ‘Nine Theories of Judicial Behavior’ in *How Judges Think* (Harvard University Press, 2008) 19, 42 <<https://www.jstor.org/stable/j.ctvj2w91.4>>; Brian Z Tamanaha, ‘INTRODUCTION’ in *Beyond the Formalist-Realist Divide* (Princeton University Press, 2010) 1, 1–6 <<https://www.jstor.org/stable/j.ctt7rm95.4>>; Brian Leiter, ‘Positivism, Formalism, Realism’, ed Anthony Sebok (1999) 99(4) *Columbia Law Review* 1138, 1144–1147.

⁴³ Joe McIntyre, ‘CSIRO Wants Our Laws Turned into Computer Code. Here’s Why That’s a Bad Idea’, *The Conversation* (20 January 2020) <<http://theconversation.com/csiro-wants-our-laws-turned-into-computer-code-heres-why-thats-a-bad-idea-130131>>.

comparing such hypothetical legislation to the early Napoleonic Code⁴⁴ which stripped the judiciary of any law-making powers.⁴⁵

Though the modern debate between legal formalism and its arguable antithesis, legal realism, began in 1905⁴⁶ with Justice Holmes' dissent in the US Supreme Court's ("USSC") *Lochner v New York*,⁴⁷ much of the Australian discussion surrounding the issue refers to Chief Justice Dixon's proclamation that 'there is no safer guide to judicial decisions in significant conflicts than a strict and complete legalism.'⁴⁸ While the statement's context as well as decisions⁴⁹ and statements⁵⁰ throughout Dixon CJ's career would suggest he was speaking specifically with regard to federal disputes and arguably not endorsing American legal formalism,⁵¹ his words would influence the Australian legal community toward the philosophy for much of the 20th Century.⁵² Presently, however, the generally accepted orthodox approach acknowledges that by the nature of the Australian legal system, its judiciary must adhere to a relatively heuristic, non-formalist jurisprudence,⁵³ aligning to the principles of modern statutory interpretation.⁵⁴ Justice Kirby, argues that 'real' judges must operate from a place which is 'neither

⁴⁴ *Code civil des français* [Civil code of the French] (France).

⁴⁵ *Ibid* art 5.

⁴⁶ Ben Green and Salomé Viljoen, 'Algorithmic Realism: Expanding the Boundaries of Algorithmic Thought' in *Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency* (ACM, 2020) 19, 6 <<http://dl.acm.org/doi/10.1145/3351095.3372840>>.

⁴⁷ 198 US 45 (1905).

⁴⁸ "Swearing in of Sir Owen Dixon as Chief Justice" (1952) 85 CLR xi, xiv.

⁴⁹ See, eg, *Australian National Airways Pty Ltd v Commonwealth (No 1)* ('*Airlines Nationalisation case*') (1945) 71 CLR 29.

⁵⁰ See, eg, Dixon J, "Concerning Judicial Method" (1956) 29 ALJ 468, 472, where Dixon distinguishes between judicial development of the law through extension of accepted principles and the deliberate abandonment of a given principle.

⁵¹ Justice Michael Kirby, "'Judicial Activism'? A Riposte to the Counter-Reformation" 11 *Otago Law Review* 1, 3–4.

⁵² *Ibid* 3. See also Bryan Horrigan, 'Australian Legal Principles in Practice – Taking Reasoning and Research Seriously' (1993) 9 *Queensland University of Technology Law Journal* 159, 162.

⁵³ Justice Michael Kirby (n 52) 4–8, 13–16.

⁵⁴ *Project Blue Sky v Australian Broadcasting Authority* (1998) 194 CLR 355, 384; *CIC Insurance Ltd v Bankstown Football Club Ltd* (1997) 187 CLR 384, 408. See also *Parrett v Secretary, Department of Family & Community Services* (2002) 124 FCR 299 [25]; *K & S Lake City Freighters Pty Ltd v Gordon & Gotch Ltd* (1985) 157 CLR 309, 315; Lisa Crawford et al, *Public Law and Statutory Interpretation: Principles and Practice* (Federation Press, 2017) 228–256 ('*Public Law and Statutory Interpretation*'); Michelle Sanson, *Statutory Interpretation* (Oxford University Press, 2016) 62–67 <<http://ebookcentral.proquest.com/lib/qut/detail.action?docID=5676439>>.

wholly mechanical, nor excessively creative’,⁵⁵ corroborating notions of a contemporary non-formalist stance of the Australian judiciary.

Putting aside the alignment of the Australian judiciary, formalism is challenged by scholars and jurists alike, who generally argue that a strictly formalist stance is detrimental to the rule of law.⁵⁶ Matczak argues that because formalism leads to outcomes which are unpredictable in the context of societal norms,⁵⁷ it is therefore incompatible with the rule of law.⁵⁸ He illustrates this with the semantics-concerned case of *Smith v United States*,⁵⁹ where the USSC held that ‘using a firearm’ included the trading of a gun for drugs. Here, Justice Scalia dissented, stating that such a strict interpretation of the phrase was unordinary and unpredictable, and therefore incompatible with the rule of law.⁶⁰

The formalist debate will inherently drive any RaC approach to ambiguity of both an unintentional nature, such as through failures of legal drafters to account for varying interpretations in unusual circumstances, and a deliberate one, via the use of terms designed to invoke judicial discretionary powers.

The former can be illustrated through *Nix v Hedden* (“*Nix*”),⁶¹ a case on the cusp of the United States’ transformation from formalism to legal realism, which saw dispute over whether, for taxation purposes, a tomato might be seen as a fruit, as it technically is botanically, or a vegetable, as it is generally, and therefore whether it would be included in a tariff on imported vegetables. In taking a unique view for the time, the USSC held that, as the general and predictable understanding of a tomato was that it was

⁵⁵ Justice Michael Kirby (n 52) 13.

⁵⁶ See, eg, Marcin Matczak, ‘Why Judicial Formalism Is Incompatible with the Rule of Law’ [2016] *SSRN Electronic Journal*.

⁵⁷ *Ibid* 21–25.

⁵⁸ The notion of ‘predictability’ as a facet of the rule of law has been affirmed throughout history. See, eg, John Locke, *Two Treatises* (Awnsham Churchill, 1689) §137 <<https://oll.libertyfund.org/pages/john-locke-two-treatises-1689>>; Friedrich Hayek, *Rules and Order*, vol 1 (University of Chicago Press, 1973) 118. See also Jeremy Waldron, ‘The Rule of Law’ in Edward N Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Metaphysics Research Lab, Stanford University, 2020) <<https://plato.stanford.edu/archives/sum2020/entries/rule-of-law/>>.

⁵⁹ *Smith v United States* 508 US 223 (1993).

⁶⁰ *Ibid* 242–247.

⁶¹ 149 US 304 (1893).

a vegetable, it would be included in the tariff on vegetable imports,⁶² aligning itself with the ‘realists’.⁶³ To replicate such a decision in code however, would require the manual determination and entry for every possible fruit and vegetable into lists in a method arguably similar to Wolfram’s natural language,⁶⁴ as opposed to simply classifying goods based on relevant attributes as in the formalist’s approach. Figure 1 demonstrates the relevance of *Nix* to RaC, illustrating how two programmers might reach separate but reasonable conclusions which would result in entirely different outcomes of the case.

```
# This code assumes the good in question can only be a fruit or a vegetable.
# It operates off the definition that a fruit is seed-bearing and originates from the
# ovaries of a flowering plant, while a vegetable is simply anything that is not a fruit.

# Set the relevant characteristics of imported "goods"
class Goods:
    def __init__(self, seeds, floweringPlant):
        self.seeds = seeds
        self.floweringPlant = floweringPlant

def tariffApplies(goods):
    if goods.floweringPlant == True:
        if goods.seeds == True:
            # Good is a fruit
            return False
        else:
            # Good is a vegetable
            return True
    else:
        # Good is a vegetable
        return True

# Define the good's relevant characteristics
# Here, 1/0 is used in place of True/False to avoid a need to convert strings 'True' and 'False'
# into boolean values.
seedsInput = input("Does the good have seeds? T/F = 1/0: ")
originInput = input("Did the good originate from the ovaries of a flowering plant? T/F = 1/0: ")

goods = Goods(bool(int(seedsInput)), bool(int(originInput)))

if tariffApplies(goods) == True:
    print("The tariff applies to the goods.")
else:
    print("The tariff does not apply to the goods.")
```

Figure II-1 – A formalist approach to *Nix v Hedden*. Compatible with Python 3. This code was developed by the author of the present article.

⁶² Ibid 306-307.

⁶³ Matczak (n 57) 22–24.

⁶⁴ Wolfram (n 8) 156–159.

```

# This code assumes the good in question can only be a fruit or a vegetable.
def tariffApplies(goods):
    Fruits = ['apple', 'banana', 'orange'] # ... etc ... (Lists determined manually)
    Vegetables = ['asparagus', 'beetroot', 'broccoli', 'tomato'] # ... etc ...

    if goods in Vegetables:
        return True
    else:
        return False

goods = input("Specify goods: ")

if tariffApplies(goods) == True:
    print("The tariff applies to the goods.")
else:
    print("The tariff does not apply to the goods.")

```

Figure II-2 – A non-formalist approach to *Nix v Hedden*. Compatible with Python 3. This code was developed by the author of the present article.

Of likely greater concern to critics such as McIntyre, however, is the potential eradication of deliberate ambiguity giving rise to judicial law-making powers. The OECD’s response to McIntyre’s Napoleonic comparison⁶⁵ acknowledged such risks, but only to the extent that RaC might result in adverse outcomes of a similar manner to other automated decision-making software.⁶⁶ Here, the OECD failed to recognise that just as they expect RaC to influence lawmakers toward reducing logical inconsistencies in their drafting,⁶⁷ it may also unintentionally encourage legislators to draft with a more formalist perspective in an attempt to accommodate digital conversion. The OECD and other adopters of RaC have further tried to soothe concerns by indicating that RaC could be limited to solely prescriptive and unambiguous legal texts.⁶⁸ Such claims appear to be at odds with RaC justifications highlighting the vast expenditure which could be saved through essentially nationalising the ‘RegTech’ industry, given the vast number of discretionary terms encountered in the legislative framework of the financial services industry⁶⁹ which provides the bulk of ‘RegTech’ work.⁷⁰

⁶⁵ McIntyre (n 44).

⁶⁶ Mohun and Roberts (n 1) 26.

⁶⁷ Mohun and Roberts (n 1). 42-45.

⁶⁸ Ibid 26, 104; ‘Rules as Code – Test, Learn, Repeat’, *Digital.NSW*

<<https://www.digital.nsw.gov.au/article/rules-code-test-learn-repeat>>; Lyria Bennett Moses, *Not a Single Singularity* (SSRN Scholarly Paper No ID 3646943, Social Science Research Network, 2020) 11–12

<<https://papers.ssrn.com/abstract=3646943>>; Frank Pasquale, ‘A Rule of Persons, Not Machines: The Limits of Legal Automation’ [2018] *Faculty Scholarship* 3 <https://digitalcommons.law.umaryland.edu/fac_pubs/1612> (‘A Rule of Persons, Not Machines’).

⁶⁹ See, eg, *National Consumer Credit Protection Act 2009* (Cth) ss 117-119, 130-131, 140-142, 153-154; *National Consumer Credit Protection Regulations 2010* (Cth) regs 28HA, 28JA. See also Australian Securities & Investments Commission, Regulatory Guide 209: Credit Licensing: Responsible Lending Conduct.

⁷⁰ Schizas et al (n 26) 12, 18, 25, 34.

At current, the notion of a truly non-formalist RaC is limited by the inherent formalism of algorithms as deterministic functions. Computer science scholars argue that algorithms may be able to evolve to a point where they might evaluate problems through a truly non-formalist method,⁷¹ but barring such, as of yet, hypothesised advances, this paper seeks to explore how one might accommodate such legal ambiguity without adhering to a strict formalist's perspective which detracts from the interpretative role of the judiciary.

C The Act of Interpretation

Among the factors informing the relationship between RaC and the interpretative role of the judiciary is the question of the 'right to interpret' in context of the doctrine of the separation of powers. Chapter three of the *Commonwealth Constitution*⁷² ("the *Constitution*") vests the judicial power of the Commonwealth in the federal courts,⁷³ extending to Australia the separation of the executive and judicial. Such a partition between the powers of the judiciary and the remaining arms of government is, in theory, a cornerstone of fair Australian governance free of arbitrary exercise of power,⁷⁴ and has found confirmation in the common law throughout the 20th Century, beginning with *New South Wales v Commonwealth*.⁷⁵ It is therefore worth exploring whether the act of converting legal texts into code would consist of 'interpreting' the law in a manner which is reserved for the judiciary, and therefore, if carried out with the authority of the legislature or executive, violate the separation of powers. Indeed, the judicial power of the courts includes independent interpretation and application of the law, free from influence by the other branches, and thus, were such an application to be used in a manner which

⁷¹ See, eg, Green and Viljoen (n 47) for an investigation into the evolution of computer science with analogy to the US legal system's growth from formalism to realism.

⁷² *Commonwealth of Australia Constitution*

⁷³ *Commonwealth of Australia Constitution* s 71.

⁷⁴ AR Blackshield, *Australian Constitutional Law and Theory: Commentary and Materials* (Federation Press, 5th ed. abridged., 2010) 8–12 ('*Australian Constitutional Law and Theory*').

⁷⁵ *New South Wales v Commonwealth* (1915) 20 CLR 54. See also *Waterside Workers' Federation of Australia v J W Alexander Ltd* (1918) 25 CLR 434; *R v Kirby; Ex parte Boilermakers' Society of Australia* (1956) 94 CLR 254.

resolves disputes with any binding authority, it would likely be deemed to interfere with this power and be held constitutionally invalid.⁷⁶

Amongst the literature addressing machine-consumable law, little has yet considered the relationship between the hypothetical programmer⁷⁷ and the judicial interpretative power, though it is expected that this field will grow as Australia moves closer to the implementation of a form of RaC. Indeed, the New Zealand Law Foundation has funded the ‘Legislation as Code in New Zealand’ project, which aims to explore RaC from a ‘constitutionally appropriate approach’,⁷⁸ including its possible effects on ‘existing constitutional principles around the separation of powers’,⁷⁹ though the project’s findings are yet to release.⁸⁰ In the absence of such literature, the functional concern can be broadened to that of an actor representing an arm of the government in converting legislation from one form into another, thus allowing for analogous scenarios to be considered. It is argued, then, that the process by which law is regularly translated from one language to another, as in, for example, the European Union (“EU”), is reasonably appropriate for comparison to the process of translating law into a machine-consumable language. Indeed, the task as defined by Ainsworth of rewriting an ‘equivalent legal text in another language, such that a decision-maker, applying either text...will arrive at the same conclusion regardless of which text is used’⁸¹ parallels the intent of developing code which is functionally equivalent with the original legal text. Further, much of the controversy surrounding multilingual rules mirror those faced in developing computational law with regard to jurisprudential takes on legal interpretation.⁸²

⁷⁶ See, eg, the majority’s finding of invalidity regarding s54R of the *Migration Act 1958* (Cth) in *Chu Kheng Lim v Minister for Immigration* (1992) 176 CLR 1.

⁷⁷ Here, the term ‘programmer’ is used to refer not just to the literal programmers, but the entire team of people involved in the design, development, and deployment of the application.

⁷⁸ Mohun and Roberts (n 1) 70.

⁷⁹ New Zealand Law Foundation, ‘Projects Funded | The Law Foundation’ <https://www.lawfoundation.org.nz/?page_id=6882>.

⁸⁰ Ibid.

⁸¹ Janet Ainsworth, ‘Lost in Translation? Linguistic Diversity and the Elusive Quest for Plain Meaning in the Law’ in *The Ashgate Handbook of Legal Translation* (Routledge, 2016) 43, 43 <<http://www.taylorfrancis.com/books/e/9781315612706>>.

⁸² See, eg, *Free Motion Fitness Inc v Cybex International Inc*, 423 F 3d 1343 (Fed Cir, 2005) and 自由位移整装公司与常州市英才金属制品有限公司、上海健达健身器材有限公司其他发明权与发现权纠纷申请再审民事裁定书 [Free Displacement Co. Ltd. v Changzhou Yingcai Metal Products Co. Ltd., Shanghai Jianda

Additional parallels can be seen in analysing theories of multilingual legal translation principles. For instance, Ainsworth⁸³ highlights the importance of heuristic translations which use plain meaning in cases of ambiguity and explores the various approaches of the Court of Justice of the European Union (“CJEU”) to judicial interpretations of multilingual frameworks. The CJEU’s relevant decisions⁸⁴ and Ainsworth’s finding of the predominate approach being one of ‘purposive interpretation’,⁸⁵ which emphasises a contextualised understanding of the intent of the legal text in question, strongly resembles the formalist-realist debate found to influence the implementation of RaC.

Further, from a constitutional perspective, the EU’s stance on multilingual legislation largely reflects what a post-RaC Australian framework might look like. Much like Australia, the EU confers the power to interpret its treaties and acts of its institutions to its highest court, the CJEU,⁸⁶ and thus, one might expect the same separation of powers issues to arise over legislative translation. However, the EU also commits to the translation of all legal texts into its member states’ languages by a body of the executive,⁸⁷ the Directorate-General for Translation,⁸⁸ and has affirmed an equal legal authority across all translations.⁸⁹ As such, it is put forward that an investigation into the legal issues surrounding the EU’s multilingual framework could shed light on how a potential RaC reform might operate within Australia’s constitutional bounds.

Fitness Equipment Co. Ltd. – Invention Rights and Discovery Rights Dispute Civil Retrial] [2014], 最高人民法院 [Supreme People’s Court, People’s Republic of China], Civil Retrial No. 497, 4 January 2015. Here, two cases stemming from the same facts were decided differently in the US and China respectively due to differing translations of a patent from English to Mandarin; one using a technical meaning, and the other using the broader day-to-day use. Cf the two valid approaches to *Nix* seen in Figure 1.

⁸³ Ainsworth (n 82).

⁸⁴ See, eg, *Schulte v Deutsche Bausparkasse Badenia* (C-350/03) [2005] ECR I-9215; *Roudolff* (C-803/79) [1980] ECR 2015; *Commission of the European Union v United Kingdom of Great Britain and Northern* (C-416/85) [1988] ECR 3127; *Elefanten Schuh GmbH v Pierre Jacqmain* (C-150/80) [1981] ECR 1671.

⁸⁵ Ainsworth (n 82) 48–50; See also Ian McLeod, ‘Literal and Purposive Techniques of Legislative Interpretation: Some European Community and English Common Law Perspective’ (2004) 29(3) *Brooklyn Journal of International Law* 1119, 1125–1132.

⁸⁶ *Treaty on the Functioning of the European Union*, opened for signature 7 February 1992, [2009] OJ C 115/199 (entered into force 1 November 1993) (‘FEU’) art 267. Cf *Commonwealth of Australia Constitution s 71*.

⁸⁷ *Treaty on European Union*, opened for signature 7 February 1992, [2009] OJ C 115/13 (entered into force 1 November 1993) (‘EU’) art 255 TEU; *Regulation (EEC) No 1 determining the languages to be used by the European Economic Community* (1958) OJ 17 arts 4, 5.

⁸⁸ Directorate-General for Communication, ‘Translation’, *European Commission* <https://ec.europa.eu/info/departments/translation_en>.

⁸⁹ *Skatteministeriet v Aktieselskabet Forsikringselskabet Codan* (C-236/97) [1998] ECR I-8679.

III CODING APPROACHES

This project will compare two methods of converting specific provisions of Chapter III of the *National Credit Act* into an RaC format and analyse which aspects of each method better respect the interpretative role of the judiciary. Approach 1 seeks to adhere to the formalistic methods analysed by Genesereth⁹⁰ and Sergo et al.⁹¹ and is most reminiscent of the methods put into place in recent RaC efforts.⁹² It is expected that where previous attempts saw success, method one will fail to adequately account for the ambiguous terms found in the *National Credit Act*. In contrast, Approach 2 acknowledges the inherent formalism of algorithms, but strives to simulate the non-formalistic approach hypothesised by Green & Viljoen⁹³ and Matczak⁹⁴ through consideration of quasi-legislative materials and manual classification techniques explored by Wolfram.⁹⁵ It is expected that this approach's outputs will be more predictable and therefore more 'just'⁹⁶ than that of approach 1, but also that it will require significantly more assumptions and interpretation of the law, therefore indicating a potential violation of the separation of powers. The type of output of both approaches envisioned in the analysis is exemplified in Section II's Figure 1.

Chapter III of the *National Credit Act* has been chosen as a test of each method because its provisions are informed by both prescriptive and discretionary clauses, as well as judicial interpretation in the form of case law⁹⁷ which suggest a non-formalist alignment,⁹⁸ allowing for a full exploration of digital

⁹⁰ Genesereth (n 18).

⁹¹ Sergo et al (n 11).

⁹² See, eg, Government Information Services (n 25) 21–24; Open Fisca (n 25).

⁹³ Green and Viljoen (n 47).

⁹⁴ Matczak (n 57) 29–34.

⁹⁵ Wolfram (n 8) 156–159.

⁹⁶ Matczak (n 57) 21–29.

⁹⁷ See, eg, Perram J, *Australian Securities and Investments Commission v Westpac Banking Corporation (Liability Trial)* [2019] FCA 1244 [68]–[70] informing what matters are 'mandatory' in determining if a credit product is unsuitable for the purposes of *National Consumer Credit Protection Act 2009* (Cth) ss 118(2), 119(2), 131(2), 141(2), 142(2), 154(2).

⁹⁸ See, eg, Davies J, *Australian Securities and Investments Commission v The Cash Store Pty Ltd (in liquidation)* [2014] FCA 926 [23] & Greenwood J, *Australian Securities and Investment Commission v Channic Pty Ltd (No 4)* [2016] FCA 1174 [1773] deterring from the dictionary definition of 'likely' in the context of responsible lending obligations; Cf the USSC's referral to the dictionary definition of 'use' in *Smith v United States* (n 60) 229 which has been criticised as a strict formalist decision; Matczak (n 57) 25–28. See also Perram

conversion techniques which previous literatures have failed to consider.⁹⁹ Further, where ambiguity is present, for example through a requirement of ‘reasonable inquiries’, guidance has been provided through quasi-legislative materials such as the Australian Securities and Investment Commission’s (“ASIC”) Regulatory Guidelines.¹⁰⁰ This guidance is neither exhaustive, nor does it guarantee compliance,¹⁰¹ and as such, its use allows for a consideration of the effects of a non-formalist alignment in coding methods. Indeed, the statement that ‘the obligations are not static – what is “reasonable” will be affected by the broader professional and regulatory environment in which [the financial institution operates]’¹⁰² is reminiscent of the non-formalist’s alignment of ever-evolving societal norms influencing judicial discretion.

From a technical standpoint, Python 3 has been selected as an appropriate machine-consumable language, given its wide use and descriptive syntax which eases understanding of its code for those who are not familiar with the language.¹⁰³ This is deemed particularly important in developing an RaC application so as to avoid opacity arising from technical illiteracy.¹⁰⁴

Code is to be written in an interview style, similar to that utilised by the Australasian Legal Information Institute’s (“AustLII”) ‘ElectKB’ application,¹⁰⁵ which questions users through a chat-like interface before generating a finding on their eligibility as a member of federal parliament under the

J, *Australian Securities and Investments Commission v Westpac Banking Corporation (Liability Trial)* [2019] FCA 1244 [68] determining that the consumer’s financial situation must be viewed ‘overall’ as opposed to by any ‘particular integer’.

⁹⁹ Cf the unambiguous and deterministic legal questions addressed in Government Information Services (n 25) 21–24.

¹⁰⁰ ‘Regulatory Guide 209: Credit Licensing: Responsible Lending Conduct’ (n 70).

¹⁰¹ Ibid r 81-83.

¹⁰² Ibid r 23(d).

¹⁰³ Toby Donaldson, ‘Python as a First Programming Language for Everyone’ (2003) <<http://www.cs.ubc.ca/wccce/Program03/papers/Toby.html>>; Vambola Leping et al, ‘Python Prevails’ in *Proceedings of the International Conference on Computer Systems and Technologies and Workshop for PhD Students in Computing* (Association for Computing Machinery, 2009) 1, 2 <<https://doi.org/10.1145/1731740.1731833>>.

¹⁰⁴ Jenna Burrell, ‘How the Machine “Thinks”: Understanding Opacity in Machine Learning Algorithms’ (2016) 3(1) *Big Data & Society* 1, 4.

¹⁰⁵ Australasian Legal Information Institute, ‘DataLex Consultation: ElectKB’, *DataLex* <<http://beta.datalex.org/app/consultation?rulebase=http%3A%2F%2Faustlii.community%2Ffoswiki%2FDataLex%2FElectKB>>.

Commonwealth Electoral Act 1918 (Cth).¹⁰⁶ To address concerns raised by Sergo et al. regarding the historical lack of an ‘unknown’ option in Boolean programs,¹⁰⁷ the Python module ‘tribool’¹⁰⁸ is used and adapted so as to emulate ternary unknown-state logic (True, False or Unknown).¹⁰⁹ Influenced by Wolfram’s advocacy for classification-based programming,¹¹⁰ an object-oriented programming (“OOP”) approach has been taken when considering legal concepts such as entities and contracts. While consensus regarding specific facets of this approach is lacking,¹¹¹ the general concepts of a variable’s class, object, and attribute hierarchy¹¹² have proven instrumental in overcoming issues of both a legal and technical nature.

IV FINDINGS

For the most part, coding of the selected provisions was fairly straightforward, though difficulties posed by the outlier provisions ultimately resulted in significant changes to the aforementioned methodology. In contrast to expectations, it was ultimately determined that attempting to compare resultant digitisation of the provisions using both formalist and non-formalist theories was a task which could not be adequately approached without straying well outside the scope of this article. Though such efforts were hypothesised and proposed in part in this section, only one approach was ultimately taken, informed by the modern approach to statutory interpretation,¹¹³ whose principles are largely embodied

¹⁰⁶ Andrew Mowbray, Philip Chung and Graham Greenleaf, *Utilising AI in the Legal Assistance Sector – Testing a Role for Legal Information Institutes* (SSRN Scholarly Paper No ID 3379441, Social Science Research Network, 29 April 2019) 3–4 <<https://papers.ssrn.com/abstract=3379441>>.

¹⁰⁷ Sergo et al (n 11) 379–380.

¹⁰⁸ Grant Jenks, *Tribool: Three-Valued Logic Data Type*. (online at 29 September 2020) <<http://www.grantjenks.com/docs/tribool/>> (‘Tribool’).

¹⁰⁹ Jeff Connelly, ‘Ternary Computing Testbed 3-Trit Computer Architecture’ (California Polytechnic State University of San Luis Obispo, 2008) 8, 58–59 <<http://xyzyy.freeshell.org/trinary/CPE%20Report%20-%20Ternary%20Computing%20Testbed%20-%20RC6a.pdf>>.

¹¹⁰ Wolfram (n 8) 156–159.

¹¹¹ Deb Armstrong, ‘The Quarks of Object-Oriented Development’ (2006) 49(2) *Communications of the ACM* 123, 123.

¹¹² Ibid 123–125; Stephen Morris, *Object-Oriented Programming under Windows* (Elsevier Science & Technology, 1994) 13, 15–18, 20–21 <<http://ebookcentral.proquest.com/lib/qut/detail.action?docID=1874406>>.

¹¹³ See Crawford et al (n 55) 228–256.

in *Project Blue Sky v Australian Broadcasting Authority*¹¹⁴ (“*Project Blue Sky*”). The modern approach involves consideration of both intrinsic and extrinsic materials,¹¹⁵ as well as the context and purposes of the legal text,¹¹⁶ and is thus inherently more aligned with non-formalism than formalism. Nonetheless, for reasons outlined below, the approach put into practice here should not be deemed a true non-formalist approach.

A Computational & Interpretative Approaches

As alluded to in the prior section, the user interface (“UI”) portion of the application was built with an interview approach in mind, focussing on prompts designed to emulate the questions a legal expert might ask in considering a scenario, and user inputs which generally took the form of ternary unknown-state logic,¹¹⁷ dates,¹¹⁸ or values sans units.¹¹⁹ Throughout the program’s life, these inputs are assigned as values of variables and used to determine which questions are asked and the ultimate determination of the program, which is delivered at the conclusion of the interview. In its current state, the application purports to identify which contraventions have been breached (if any), what the consequences of these contraventions are in terms of civil and criminal penalty units, and any uncertainties arising from ‘indeterminate’ inputs which might decrease the reliability of the determination.

Subjects of clauses were classified using an OOP approach, exemplified in Figure 2, which assisted in managing the large number of variables associated with determining a breach of the relevant provisions.

¹¹⁴ (1998) 194 CLR 355. Note, however, that the ‘modern approach to statutory interpretation’ as a term was first used a year prior by the High Court in *CIC Insurance Ltd v Bankstown Football Club Ltd* (1997) 187 CLR 384.

¹¹⁵ See, eg, *Acts Interpretation Act 1901* (Cth) s 15AB.

¹¹⁶ *Project Blue Sky v Australian Broadcasting Authority* (1998) 194 CLR 355, 384; *CIC Insurance Ltd v Bankstown Football Club Ltd* (1997) 187 CLR 384, 408.

¹¹⁷ Answered through a custom made function, ‘bool_input(string)’ which accepted inputs of ‘1’, ‘0’, or ‘?’ for ‘True/Yes’, ‘False/No’, or ‘Indeterminate’ respectively and was built upon the tribool software developed by Jenks (n 109).

¹¹⁸ Parsed using Python’s built-in datetime module: Python Software Foundation, ‘Datetime — Basic Date and Time Types’, *Python 3.8.6 documentation* (Documentation, 29 September 2020) <<https://docs.python.org/3/library/datetime.html>>.

¹¹⁹ For example, a credit limit without a preceding currency symbol, or contract term without a preceding unit of days.

```

class Trust:
    def __init__(self, name, numTrustees, exists):
        self.name = name
        self.numTrustees = numTrustees
        self.exists = exists

```

Figure IV-1 – A simple example of a class defining a trust. For the selected provisions, the relevant properties of a given trust are the number of trustees it had and whether it existed at the relevant time. The trust’s name is also included as a property for the purposes of the application’s UI and internal logic. *Compatible with Python 3. This code was developed by the author of the present article.*

Further, the OOP approach suited a module-based structure in which, generally, each relevant section of the *National Credit Act* is coded as a separate function called from the ‘main()’ program, a task which would have been significantly more difficult if variables were to be supplied and returned individually instead of as object properties. In addition to making the code generally easier to follow, this modular approach, an example of which is seen in Figure 2, allows for ease of modification in the debugging process or in the case of amendments to the legislation.

```

#Evaluate s131
if (Entities[0].creditProvider and Entities[0].licensee and Entities[1].consumer and contract.exists
and assessment.exists):
    s131vars = NCCPA.s131(Entities[0], Entities[1], contract, assessment, civilUnits, criminalUnits)
    contract = s131vars[0]
    Entities[1] = s131vars[1]
    Contraventions.update(s131vars[2])
    civilUnits = s131vars[3]
    criminalUnits = s131vars[4]

```

Figure IV-2 – An example of the modular nature of the application is seen in this snippet which calls the s 131 function. *Compatible with Python 3. This code was developed by the author of the present article.*

Here, each section is coded as a separate function which is called under certain conditions using relevant variables as arguments and returning any modified or new variables. Section 131 is only called where a contract exists between two entities (the provider and debtor), and under that contract the provider, ‘Entities[0]’, is both a credit provider and licensee as defined by the Act, while the debtor, ‘Entities[1]’, is a consumer as defined by the Act, and finally, an assessment of the unsuitability of the contract for the provider has been made by the debtor. The function is provided with object arguments representing both parties, the contract and assessment, and integer arguments representing the currently accrued civil and criminal penalty units. When the function has completed running, it returns a list containing modifications to variables (such as the summed civil penalty units or properties of the contract) and the section’s local contraventions, which are then added to the list of all contraventions.

While attempts to code and compare the full application as informed by formalist and non-formalist theories respectively ultimately failed, clear distinctions between the approaches still became apparent in the process of encoding specific clauses. In such cases, code was written with regard to the principles of modern statutory interpretation which typically resulted in a non-formalist interpretation. Section 133, which prohibits licensees from entering, or increasing the credit limit of, unsuitable credit contracts, provided two examples of such interpretative decisions.

Section 133 is largely functionally identical to s131, which prescribes an obligation on licensees to assess a contract which is unsuitable for consumers as unsuitable. Both sections prescribe the prohibition and obligation respectively in subsection (1) and use subsections (2)-(4) to describe when a contract is unsuitable for the purposes of subsection (1). These subsections are nearly identical and have no functional difference, but s133 also includes an additional subsection which delegates power to the regulations¹²⁰ to “prescribe particular situations in which a credit contract is taken not to be unsuitable for a consumer”.¹²¹ The resultant interpretative question thus became whether the regulations might be empowered to prescribe such situations in which a credit contract is not unsuitable for the purposes not just of s133, but also of s131. Lacking any limiting conditions such as “for the purposes of this provision”, a strict formalist would likely argue in favour of applying this power to s131 as well, while a non-formalist might point out that the omission of subsection (5) in s131’s otherwise identical set of subsections defining when a contract is unsuitable is a deliberate indicator that Parliament did not intend for the regulations to be empowered to prescribe such circumstances for the purposes of s131. Lacking any clarity in the regulations or relevant explanatory memoranda,¹²² it was ultimately determined that the modern principles of statutory interpretation aligned with the non-formalist approach to this particular issue, and thus, the application was coded accordingly.

¹²⁰ *National Consumer Credit Protection Regulations 2010* (Cth)

¹²¹ *National Consumer Credit Protection Act 2009* (Cth) s 133(5).

¹²² Explanatory Memorandum, *National Consumer Credit Protection Bill 2009* (Cth) 109-113.

A similar example arose out of s133(6), which prescribes a criminal penalty of two years imprisonment where a ‘person’ subject to s133(1)¹²³ engages in conduct¹²⁴ which contravenes s133(1).¹²⁵ Given that, for the purposes of the Act, a ‘person’ need not be a natural person¹²⁶ it was necessary to convert this penalty to one which could apply to all entities, an effort which is informed through rejection of strict formalism and consideration of explanatory memoranda. Where a provision such as s133(6) prescribes imprisonment as a punishment for offence, the *Crimes Act 1914* (Cth) (“the *Crimes Act*”) empowers the courts to instead convert the imprisonment period to penalty units per Equation (1).¹²⁷

$$P_{max} = 5 \times \text{Term of Imprisonment}$$

Where:

(1)

- P_{max} = The maximum number of criminal penalty units which may be imposed by the court.

Section 4(3) of the *Crimes Act* further establishes a relationship between the maximum pecuniary penalty for a body corporate and that for a natural person. One might correctly assume that the conversion set out in subsection (2) should therefore indicate that a similar conversion can be applied to body corporates, but this could ultimately only be confirmed through consideration of the explanatory memorandum.¹²⁸

Additional interpretative issues arose which were better addressed through deferral to caselaw, such as determining whether a breach has occurred under s131 in the absence of any preliminary assessment. While the lack of an assessment in the relevant circumstances would certainly result in a s128 breach, the temporal nature of s131(2), enshrined in the phrasing, “the contract will be unsuitable for the consumer if, at the time of the assessment,” would suggest that no breach would occur under s131(1).

¹²³ *National Consumer Credit Protection Act 2009* (Cth) s 133(6)(a).

¹²⁴ *Ibid* s133(6)(b).

¹²⁵ *Ibid* s133(6)(c).

¹²⁶ See, eg, *Ibid* ss 5 (definition of ‘person’), 14-15, 53(3).

¹²⁷ *Crimes Act 1914* (Cth) s 4B(2)

¹²⁸ Explanatory Memorandum, Crimes Legislation Amendment Bill 1987 (Cth) 11. See also National Judicial College of Australia, ‘Corporations’, *Commonwealth Sentencing Database* (Database) <<https://csd.njca.com.au/principles-practice/categories-of-federal-offenders/corporations2/>>. See also Explanatory Memorandum, National Consumer Credit Protection Bill 2009 (Cth) 113. Though the reference here to 100 penalty units is outdated, it confirms that conversion is permissible.

This interpretation might seem counterintuitive and at odds with Parliament’s intent,¹²⁹ as it functionally punishes licensees who conduct insufficient assessments moreso than those who conduct no assessment whatsoever.¹³⁰ Despite this, when such facts came before the Federal Court in *Australian Securities and Investments Commission v Cash Store Pty Ltd (in liquidation)*¹³¹ (“Cash Store”) the licensees, who had failed to make any preliminary assessments, were found to have breached ss128-130, but not s131.¹³² In translating this decision to the application, the s131 function is thus only called where the ‘assessment.exists’ property is true, as in Figure 4.

```
#Evaluate s131
if (Entities[0].creditProvider and Entities[0].licensee and Entities[1].consumer and contract.exists
and assessment.exists):
    s131vars = NCCPA.s131(Entities[0], Entities[1], contract, assessment, civilUnits, criminalUnits)
```

Figure IV-3 – In consistence with the *Cash Store* judgement, s131 is only evaluated where a relevant assessment exists. Compatible with Python 3. This code was developed by the author of the present article.

B The Discretionary Dilemma

Ultimately, while the considered literature has not erred in identifying formalist and non-formalist considerations as relevant in the task of digitising legislation, it is put forward that the proposed methodology’s framing of the problem within the context of legal formalism was perhaps short-sighted. While such theories of interpretation should certainly be referred to throughout the act of coding, attempting to adhere fully to one alignment or the other was ultimately harmful to the exercise on the basis that, barring significant legal reform or technological advances, one cannot expect to produce digitised legislation which is fully formalist or non-formalist. This dilemma arises largely – though not solely – due to the presence of discretionary clauses.

¹²⁹ An assertion which is admittedly put forth absent any justification in the relevant explanatory memorandum or other extrinsic materials: Explanatory Memorandum, National Consumer Credit Protection Bill 2009 (Cth) 109-111.

¹³⁰ A similar dilemma is posed through the consideration that s130(c)’s imposed obligation to verify a consumer’s financial situation could presumably only arise on the condition that the licensee has met their s130(b) obligation to inquire about the consumer’s financial situation.

¹³¹ [2014] FCA 926.

¹³² *Australian Securities and Investments Commission v Cash Store Pty Ltd (in liquidation)* [2014] FCA 926, [69], 75.

In the case of the non-formalist approach, it was found that presence of discretionary clauses posed computational problems not yet addressed in the literature through incompatibility with the calculative and deterministic nature of algorithms first raised in Section II, and ultimately, this article failed to identify a justifiable non-formalist approach to such provisions. Initial efforts revolved around attempting to address the incompatibility of algorithms with non-formalism through quantitative emulation of non-formalist decisions. It was hypothesised that this might be achievable by determining, for example, whether a set of given inquiries were reasonable,¹³³ through calculating the weighted sum of all possible non-formalist considerations¹³⁴ against a given threshold. This method, much like the neural networks of machine learning,¹³⁵ emulates the process by which neurons in a brain are activated based on a series of weighted binary inputs,¹³⁶ and is therefore an arguably appropriate starting point for modelling the process by which one might exercise discretion. Such an approach is described in Equation (2) and visualised logically in Figure 5.

$$\sum_n w_n X_n \geq T$$

Where:

- X_n = A binary value representing whether the n th source of information has been considered (1) or not (0).
 - w_n = The weighting given to X_n .
 - T = The prescribed threshold that must be met or surpassed for a licensee to have ‘passed’ the requirement.
- (2)**

¹³³ For the purposes of, for example, the s130(1) inquiries obligations.

¹³⁴ Such as, for example, the considerations raised at Australian Securities & Investments Commission, Regulatory Guide 209: Credit Licensing: Responsible Lending Conduct r 58.

¹³⁵ See, eg, Bengio (n 29).

¹³⁶ See, eg, Donald L Schomer and Fernando H Lopes da Silva, *Niedermeyer’s Electroencephalography: Basic Principles, Clinical Applications, and Related Fields* (Lippincott Williams & Wilkins, 6th ed, 2010); Mauricio J Giuliodori and Gustavo Zuccolilli, ‘Postsynaptic Potential Summation and Action Potential Initiation: Function Following Form’ (2004) 28(2) *Advances in Physiology Education* 79.

```

relevantFactors = {"Factor 1":1, "Factor 2":4, "Factor 3":0.5 ... "Factor n":2} # Assign a weighting
to each relevant factor

runningTotal = 0
for factor in relevantFactors:
    X = int(input("In making the inquiries, did the licensee consider " + factor + "? [1/0] "))
    #Answer the question in binary (1/0)
    w = relevantFactors.get(factor) # Get the weighting for the given factor
    runningTotal += X*w # Add weighted value to running total if considered (if not, add 0)

if runningTotal >= threshold:
    obligationMet = True
else:
    obligationMet = False

```

Figure IV-4 – Equation (2) represented in python syntax. Each relevant factor is assigned a weighting which is multiplied by 1 if it has been considered, or zero if not. These resultant values are summed as each factor is checked. If, after all checks, the running total is equal to or surpasses a given threshold, the licensee can be considered to have met their obligation to make ‘reasonable inquiries’. *Compatible with Python 3. This code was developed by the author of the present article.*

It became apparent, however, that no practicable method of determining acceptable weightings and thresholds could be produced with any academic or legal justification present in the literature. Nonetheless, it is put forward that such efforts would be well-suited in further RaC research, particularly in analysing how the field might evolve from deterministic code to predictive systems developed using machine-learning methods. Specifically, such attempts at quantifying legal discretion harken to the limited but relevant literature surrounding attempts to quantify ‘reasonable doubt’ in criminal trials,¹³⁷ as proposed in *United States v Copeland*.¹³⁸ It is noted that the common critiques of quantifying such thresholds involve doubt that the jury might adequately adhere to the given quantification without it interfering with the way they view evidence,¹³⁹ and as such an err inherently cannot extend to an algorithm, it is posited that further investigation could produce methods supported by academic and legal justification.

¹³⁷ See, eg, Daniel Pi, Francesco Parisi and Barbara Luppi, *Quantifying Reasonable Doubt* (SSRN Scholarly Paper No ID 3226479, Social Science Research Network, 5 August 2018) <<https://papers.ssrn.com/abstract=3226479>>; Jon O Newman, ‘Quantifying the Standard of Proof beyond a Reasonable Doubt: A Comment on Three Comments’ (2006) 5(3–4) *Law, Probability and Risk* 267 (‘Quantifying the Standard of Proof beyond a Reasonable Doubt’); Harry Saunders, ‘Quantifying Reasonable Doubt: A Proposed Solution to an Equal Protection Problem’ [2005] *bepress Legal Series* <<https://law.bepress.com/expresso/eps/881>> (‘Quantifying Reasonable Doubt’); James Franklin, ‘Case Comment—United States v. Copeland, 369 F. Supp. 2d 275 (E.D.N.Y. 2005): Quantification of the “Proof beyond Reasonable Doubt” Standard’ (2006) 5(2) *Law, Probability and Risk* 159 (‘Case Comment—United States v. Copeland, 369 F. Supp. 2d 275 (E.D.N.Y. 2005)’). See also Erica Goldberg, ‘Getting beyond Intuition in the Probable Cause Inquiry’ (2013) 17 *Lewis & Clark Law Review* 789.

¹³⁸ 369 F. Supp. 2d 275, 286 (EDNY 2005); Cf *Commonwealth v Rosa* 661 NE 2d 56, 63 (1996); *Wilson v Maryland* 370 Md. 191, 214.

¹³⁹ See, eg, Mandeep K Dhimi, ‘On Measuring Quantitative Interpretations of Reasonable Doubt’ (2008) 14(4) *Journal of Experimental Psychology. Applied* 353, 361–362.

In contrast to the computational difficulties encountered operating as a non-formalist, approaching discretionary terms from a strict formalist's approach was deemed to be an inherently flawed process. Indeed, it is argued that the very existence of such discretionary terms invalidates the notion that the law could ever be adequately coded in an absolutely strict formalist manner. Beyond statute, cases considering Chapter III have been influenced by the principles of modern statutory interpretation which inherently disagree with certain facets of formalism.¹⁴⁰ Referring to provisions included in this coding exercise, Lee J wrote that "if...Parliament intended to make it pellucid exactly what licensees needed to do before entering into a credit contract, that effort miscarried."¹⁴¹ In light of the literature considered in Section II, it is argued that such a statement places Chapter III of the *National Credit Act* irretrievably at odds with the notion of legal formalism. Attempting to code it in such way, therefore, was soon considered a fool's errand.

In light of these understandings, the approach which was ultimately applied in coding discretionary clauses was to treat them not as a question of law, as they would be considered by the courts, but as one of fact. To this end, one might interpret the relevant questions concerning the obligations described in, for example, s130(1), being "is it factually correct that reasonable inquiries were made regarding *x*?" Such an approach is obviously problematic in that it knowingly distances itself from the approach the judiciary would take and places discretionary power in the hands of the user, whose authority and role in the dispute is undefined. Despite this, it is argued that, absent a non-formalist method of algorithmically determining 'reasonableness', the factual approach is most practical and appropriate when considering the potential contexts in which such an application might be deployed. If operated in a private advisory context, the act of determining whether something is likely to be deemed 'reasonable' is performed regularly by licensees making internal judgements as to whether their processes are compliant with the law, and such an application would merely be an extension of this. If, however, such an application was deployed in a legally binding context,¹⁴² broader questions would need consideration

¹⁴⁰ See supra Section II.

¹⁴¹ *Australian Securities and Investments Commission v Westpac Banking Corporation* (2020) 380 ALR 262, 296.

¹⁴² The possibilities and consequences of which are hypothesised in the following section.

regarding the factual accuracy of all inputs. Though such questions threaten to breach the scope of this article, it is proposed that such user inputs could be treated in the same manner in which a statutory declaration might, prompting the licensee to declare that they subjectively believe they have been ‘reasonable’ as informed by the relevant guidelines.

Ultimately, the coding exercise that was undertaken illustrated fairly clearly that adhering strictly to a formalist or non-formalist philosophy is unhelpful, both in describing and developing RaC. Within the context of the presently available literature, it was determined that a more appropriate method would be to emulate the modern approach to statutory interpretation. While such an approach is useful in the context of RaC, it is not one which is inherently designed to assist in translating from one language, plain text, to another, machine-consumable code, and thus, the remainder of this paper seeks to propose an alternative approach based off the manner in which legal texts are produced and published in multilingual jurisdictions.

V AN ALTERNATIVE APPROACH: MULTILINGUAL LEGISLATION

Absent a clear solution stemming from comparisons of formalism and non-formalism-influenced coding, it is proposed, as alluded to in Section II, that analysing the approaches taken in jurisdictions with multilingual legislation could bare more positive findings. This section argues that lessons learned from multilingual jurisdictions are particularly applicable to both the development and publication of RaC by showing similarities in the challenges faced and applying principles of legal translation to RaC issues. Concerning multilingual drafting in the context of a supranational regime such as the EU, Solan¹⁴³ identifies three goals: equality of language, fidelity in interpretation and efficiency of translation.¹⁴⁴ Though certainly an important consideration in encoding legal rules, the latter falls outside of the scope of the presently tested methodology, which instead purports to consider and compare equality with fidelity. Where the multilingual notion of equality is concerned with the EU’s

¹⁴³ Lawrence Solan, ‘The Interpretation of Multilingual Statutes by the European Court of Justice’ (2009) 34(2) *Brooklyn Journal of International Law* 277.

¹⁴⁴ *Ibid* 279–280.

declaration that all translations of a law hold equal authority,¹⁴⁵ this article questions whether such an affirmation should be made with regards to the authority of any conclusions reached by digitised legislation. Similarly, the notion of fidelity is prioritised in both multilingualism and digitisation of legislation, with this article's considerations of ambiguity and syntactic differences between natural languages mirroring the concerns of legal translators.

A Equality

A largely unanswered question amongst RaC endeavours is that of the context in which such a solution might be deployed, yet such a decision is arguably vital in ensuring efficient and effective development both from a technical and legal standpoint. The question of how constitutionally valid the act of programming law might be can only be answered when the program's contextual application, and therefore its standing compared with standard legislation, is known.

For present purposes, it is posited that a spectrum describing legal authority upon which an RaC application might be placed, can be split into three broad areas: advisory, influential, and binding. For example, within the context of Australia's banking compliance framework, the 'advisory' section of such a spectrum might be populated by legal textbooks on consumer law or a barrister's opinion, while the 'influential' area would be populated, for example, by ASIC's regulatory guidelines and explanatory memoranda. Within the 'binding' portion of the spectrum, one would expect caselaw, regulations and statute.

Considering in which third of this spectrum an RaC application might be deployed helps to define the constitutional roadblocks a programmer might navigate in interpreting and publishing, while also assisting in setting boundaries upon the actual functionality and design of the application. For example, AUSTLII's 'ElectKB' application¹⁴⁶ gathers information and draws conclusions surrounding an

¹⁴⁵ *Skatteministeriet v Aktieselskabet Forsikringselskabet Codan* (C-236/97) [1998] ECR I-8679.

¹⁴⁶ Australasian Legal Information Institute (n 106).

individual's eligibility as a member of federal parliament.¹⁴⁷ This is achieved through a simple chatbot interface in which users are asked relevant questions and can respond only with 'yes', 'no', 'uncertain' or ask why a question is relevant. ElectKB simply accepts limited inputs to hard-coded questions as facts and applies them directly to a straightforward set of rules from relevant legislative pieces,¹⁴⁸ and thus beyond its obvious purpose as a basic proof of concept for RaC applications, ElectKB's sole objective is to advise its user of the relevant law.¹⁴⁹ In contrast, the use of automation tools in the judiciary, such as the Wisconsin Supreme Court's use of the COMPAS software to predict recidivism,¹⁵⁰ provide insights through complex algorithms which influence judicial decision-making, and would fall within the boundaries of 'influential'. Finally, Centrelink's Online Compliance Intervention scheme, better known as 'robodebt',¹⁵¹ might arguably be considered 'binding', with a caveat. Strictly, the Full Federal Court majority held in *Pintarich v Deputy Commission of Taxation*¹⁵² ("*Pintarich*") that a binding decision cannot be made without a mental process on the part of the authorised officer,¹⁵³ though by placing an onus upon debtors to take action on behalf of an executive agency, the scheme purported itself to be binding, creating a presumption of validity.¹⁵⁴

That the provided examples grow increasingly controversial as one travels positively along the spectrum of legal authority should come as no surprise and illustrates the importance of context in determining how constitutionally valid the act of converting legislation to code might be. Indeed, if the *Pintarich* decision holds, it would seem that an RaC application could not be taken to have binding outputs, insofar

¹⁴⁷ Mowbray, Chung and Greenleaf (n 107) 3–5.

¹⁴⁸ *Commonwealth Electoral Act 1918* (Cth) and the *Commonwealth of Australia Constitution*.

¹⁴⁹ Note that this assertion is speaking from the perspective of an 'ElectKB' application being deployed to be used in a manner in which its determination can be relied upon. In reality, upon attempting to use the current application, one will be met with a disclaimer prohibiting reliance upon its findings and permitting use only in the case of testing or educational purposes until it is developed further: Australasian Legal Information Institute, *ElectKB* (Australasian Legal Information Institute, 2020) <<http://austlii.community/foswiki/DataLex/ElectKB>>.

¹⁵⁰ See, eg, *Loomis v Wisconsin* 881 NW 2d 749 (Wis, 2016). See also Jeff Larson et al, (n 36); Angwin, Julia and Jeff Larson (n 36); Liu, Lin and Chen (n 30).

¹⁵¹ See Senate Standing Committees on Community Affairs, Parliament of Australia, *Design, scope, cost-benefit analysis, contracts awarded and implementation associated with the Better Management of the Social Welfare System initiative* (Report, June 2017) <https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/SocialWelfareSystem/Report>.

¹⁵² [2018] FCAFC 79.

¹⁵³ *Ibid* [140]–[143].

¹⁵⁴ *Minister for Natural Resources v New South Wales Aboriginal Land Council* (1987) 9 NSWLR 154, 164 (McHugh J).

that ‘decision-making’ is required, without some form of human intervention, though this condition is not certain. In his dissent, Kerr J argued that the ‘mental process’ element relied upon by the majority, stemming from Finn J in *Semunigus v Minister for Immigration and Multicultural Affairs*¹⁵⁵ (“*Semunigus*”) and accepted on appeal to the Full Federal Court,¹⁵⁶ was misapplied because its establishment in *Semunigus* lacked the context of intelligent, algorithmic decision-making systems, such as the system in question in *Pintarich*.¹⁵⁷ Justice Kerr further argued that in light of the increasing prevalence of such systems, the majority’s decision promoted unfairness and administrative uncertainty.¹⁵⁸ While the majority agreed that the outcome could lead to these unwelcome results,¹⁵⁹ they justified it via claim that such circumstances were “quite unusual” and “unlikely to arise very often”.¹⁶⁰ While the High Court refused the opportunity to consider this,¹⁶¹ the majority’s decision has been widely criticised for denying the growing dominance of automation in administrative decision-making,¹⁶² and given the vast majority of automated systems in administrative decision-making at present, it seems unlikely that the *Pintarich* decision should be taken to apply to all automated decisions.¹⁶³ Interestingly, the Australian Taxation Office appeared to distance itself from such a broad precedent, noting in the case’s Decision Impact Statement¹⁶⁴ that, in contrast to Kerr J’s remarks, the facts did not involve the use of “automated ‘intelligent’ decision-making systems such as to lay down the application of some wider legal principle to such systems.”¹⁶⁵

¹⁵⁵ [1999] FCA 422, [19].

¹⁵⁶ *Semunigus v Minister for Immigration and Multicultural Affairs* (2000) 96 FCR 533, 536, 540, 546-547.

¹⁵⁷ *Pintarich v Deputy Commission of Taxation* [2018] FCAFC 79, [46]-[50].

¹⁵⁸ *Ibid*, [64]-[65].

¹⁵⁹ *Ibid*, [151]-[152] (Moshinsky and Derrington JJ).

¹⁶⁰ *Ibid*, [152].

¹⁶¹ *Pintarich v Deputy Commission of Taxation* [2018] HCASL 322.

¹⁶² See, eg, Anna Huggins, ‘Automated Processes and Administrative Law: The Case of Pintarich’, *AusPubLaw* (Australian Public Law) <<https://auspublaw.org/2018/11/the-case-of-pintarich/>>; Nassim Khadem, ‘Tax Office Computer Says Yes, Federal Court Says No’, *ABC News* (online, 5 October 2018) <<https://www.abc.net.au/news/2018-10-05/tax-office-computer-says-yes-federal-court-says-no/10341548>>; Justin Dabner, ‘Tax Law and Technology in Australia’ (Social Science Research Network, 2019) 9 <<https://papers.ssrn.com/abstract=3253400>>.

¹⁶³ See also Principal 1 in Administrative Review Council, *Automated Assistance in Administrative Decision Making* (No 46) vii <<https://www.ag.gov.au/legal-system/publications/report-46-automated-assistance-administrative-decision-making-2004>>. Here it is indicated that automated decision-making is suitable in non-discretionary cases.

¹⁶⁴ Australian Taxation Office, *Decision Impact Statement on Pintarich v Deputy Commission of Taxation* [2018] FCAFC 79 (4 April 2019).

¹⁶⁵ *Ibid*.

Of greater importance than the *Pintarich* decision, however, is the constitutional issue raised in Section II. As noted previously, in the absence of literature addressing this issue, this paper analogises it to the question of authority vested in legislative translations present in multilingual jurisdictions, such as the EU. In extending such an analogy, a hypothetical binding context within which RaC might be deployed is as a piece of digitised legislation which is wholly equal in authority to its non-digitised counterpart, in much the same way that a given translation of an EU legal text has equal authority to all other translations.¹⁶⁶ As highlighted in Section II, the separation of powers is arguably present within the EU's constitutional framework, given that the power to interpret treaties is vested in its courts,¹⁶⁷ just as the federal courts of Australia enjoy the power to interpret Commonwealth legislation.¹⁶⁸ Nonetheless, the role of translating EU legislation, one which inherently involves interpretation, is conducted outside of the judiciary. Specifically, while translations are carried out by the Directorate-General for Translation,¹⁶⁹ an executive body,¹⁷⁰ they are technically drafted and published by the Council of the European Union and the European Parliament, bodies of the legislature,¹⁷¹ in a process which blurs the separation of powers. In a departure from the analogy to Australia's constitutional framework, however, the executive body of the EU, the European Commission,¹⁷² also operates as a legislative body and holds the sole right to legislative initiation.¹⁷³ In this sense, the entire translation process might be deemed to be carried out by the legislature, though the presence of the Directorate-General for Translation, an agency of the European Commission within its capacity as a body of the executive,¹⁷⁴ would upset this argument. If then, the process of legislative translation in the EU is taken

¹⁶⁶ *Skatteministeriet v Aktieselskabet Forsikringselskabet Codan* (C-236/97) [1998] ECR I-8679.

¹⁶⁷ *FEU*, opened for signature 7 February 1992, [2009] OJ C 115/199 (entered into force 1 November 1993) art 267.

¹⁶⁸ *Commonwealth of Australia Constitution* s 71.

¹⁶⁹ Directorate-General for Communication (n 89).

¹⁷⁰ *Treaty on European Union*, opened for signature 7 February 1992, [2009] OJ C 115/13 (entered into force 1 November 1993) ('EU') art 255 TEU; *Regulation (EEC) No 1 determining the languages to be used by the European Economic Community* (1958) OJ 17 arts 4, 5.

¹⁷¹ Colin Robertson, 'EU Legislative Texts and Translation' in *The Ashgate Handbook of Legal Translation* (Routledge, 2016) 155, 158–159 <<https://www-taylorfrancis-com.ezp01.library.qut.edu.au/books/e/9781315612706>>.

¹⁷² *Treaty establishing the European Community*, opened for signature 7 February 1992, [1992] OJ C 224/6 (entered into force 1 November 1993) ('EC Treaty') art 202.

¹⁷³ *FEU*, opened for signature 7 February 1992, [2009] OJ C 115/199 (entered into force 1 November 1993) art 294.

¹⁷⁴ Directorate-General for Communication (n 89).

to consist of a recommendation – translation of the original law – by the executive to the legislature, followed by the drafting and publication of law matching this recommendation, then the resultant new laws could be taken not as interpretations, but as new drafts which are functionally equivalent to the original law. Encroachment upon the judicial power of interpretation, therefore, is avoided in entirety, and the separation of powers is upheld.

Similarly, in an Australian context considering RaC in the place of multilingual legislation, while the executive is forbidden from creating law,¹⁷⁵ there exists no such prohibition toward making recommendations to the legislature. Thus, if a body of the executive tasked with converting legislation into code made recommendations to Parliament, the latter's publication of the digital legislation could be seen by analogy to be entirely within the bounds of the separation of powers. In this sense, constitutionally, there arguably is no reason that a piece of digitised legislation could not be equal in authority to its standard counterpart. Of course, whether or not such authority should be applied to the output of an RaC application given accurate inputs is an entirely separate question.

Concerns of incorrect conclusions might be soothed through an overriding principal that, in the event of dispute, the judiciary may preference a standard legal text over its RaC counterpart.¹⁷⁶ Despite the EU's principal of lingual equality in law, early CJEU cases would, at times, preference original legislative drafts over their translations.¹⁷⁷ *Stauder v City of Ulm*,¹⁷⁸ for example, saw the original draft of a regulation in French accepted over its equally reasonable German and Dutch translations, with the court concluding that the variation in the latter two must have stemmed from translational errors.¹⁷⁹ Solan notes that this approach is the “functional equivalent of selecting an official language” and that as such, it has been used less in recent years so as to avoid encroaching on the sovereignty and equality

¹⁷⁵ While it is acknowledged that such a prohibition is nullified where the executive is delegated lawmaking power under a given piece of legislation, this article is concerned with a broader view of the separation of powers as a theory, as opposed to how it specifically interacts with individual laws.

¹⁷⁶ Such a principle need only be necessarily established when considering RaC as potential legislation, as opposed to an administrative decision-maker which merely applies plain text laws. In the latter case, of course, RaC would be subject to judicial review: *Commonwealth of Australia Constitution s 75(v)*.

¹⁷⁷ Solan (n 144) 287.

¹⁷⁸ *Stauder v Ulm* (C-29/69) [1969] ECR 419.

¹⁷⁹ *Ibid* 3-7.

of its members.¹⁸⁰ While such concerns are perfectly valid, no such concerns could be reasonably applied to the relationship of digital and non-digital legislation, and thus, a principal recognising the latter as more authoritative in the event of a dispute is likely to be uncontroversial.¹⁸¹ Indeed, identifying an RaC application as legally inferior to standard legislation could see it deemed delegated legislation as prepared by a body of the executive, as opposed to a ‘copy’ and, therefore, interpretation of the given act, and in this sense, avoid breaching or blurring the separation of powers beyond those breaches which are already present in the numerous regulations prescribed by administrative bodies.

In light of such drafting processes, it becomes apparent how the multilingual approach might inform where an RaC application could fit along the spectrum of legal authority. Following the approach adopted by monolingual nations with diversified populations, the application might be considered merely advisory but lacking legal force,¹⁸² presenting a solution to the status quo issue raised in Section II of inefficiency in development of private compliance systems. While a judicially influential categorisation would be largely redundant given how rarely Chapter III disputes reach beyond mandated dispute resolution schemes¹⁸³ to the courts, the EU approach sheds light on how an RaC application could be accepted as binding insofar that the separation of powers is concerned. Of course, whether such a solution should be adopted in practice depends largely upon how accurately it represents the letter of the law.

¹⁸⁰ Solan (n 144) 287. See, also, the similar approach adopted in, eg, *Itegeko Nshinga rya Repubulika y'u Rwanda 2003* [Constitution of the Republic of Rwanda 2003] art 96.

¹⁸¹ Such an approach has been taken in multilingual unilateral environments where notions of sovereignty and linguistic equality are similarly irrelevant. See, eg, *Bunreacht na hÉireann* [Constitution of Ireland] art 8. See also the approach adopted by Luxembourg which reduces translations to a non-binding, advisory role: *Loi sur les régimes des langues 1984* [Languages Regulation Act 1984] (Luxembourg) art 2.

¹⁸² As in, for example, Brazil: Celina Frade, ‘Translating Domestic Legislation’ in *The Ashgate Handbook of Legal Translation* (Routledge, 2016) 209, 211 <<https://www-taylorfrancis-com.ezp01.library.qut.edu.au/books/e/9781315612706>>; Deborah Cao, *Translating Law* (Multilingual Matters, 2007) 103.

¹⁸³ *National Consumer Credit Protection Act 2009* (Cth) ss 47(1)(h)-(i). See also *Corporations Act 2001* (Cth) ss 912A(1)(g), 912A(2), 1017G(1)-(2); *Superannuation Industry (Supervision) Act 1993* (Cth) ss 101(1)-(1A); *Retirement Savings Accounts Act 1997* (Cth) s 47(1).

B Fidelity

With regard given to the vast literature surrounding the formalism debate of the twentieth century, it should come as no surprise to the legal community that the notion of fidelity is arguably the greatest source of conflict in translation theory.¹⁸⁴ Beyond traditional principles, theories of legal translation have evolved from mere ruminations of translational theorists to their own widely considered field.¹⁸⁵ Consequently, approaches to legal translation have become more nuanced, acknowledging, for example, the error of attempting to apply the traditionally accepted recipient-oriented translational approach, which threatens “dethronement” of the source text,¹⁸⁶ to legal texts. Such academic progress has had great ramifications for how multilingual translation might inform the processes of both digitising legislation as well as potentially using such digitised texts as a tool of interpretation in disputes. Regarding the latter, Solan shows that, rather than a hinderance, the CJEU has viewed the wide variety of translations available as a “unique kind of evidence of purpose”,¹⁸⁷ serving as a further tool into the intent of the legislature. Indeed, in this context, and in light of the potential drafting process explored in the prior subsection, the presence of a translation of legislation into logical code could help to outline its true intent, as the OECD initially proposed.¹⁸⁸

In considering the lessons learned toward the former, that is, the manner in which multilingual translation might inform the process of specifically converting written legislation into code, one might analyse the evolution of the linguist’s approach to superfluous or otherwise inefficiently worded literal translations. Historically, legal translation was translated strictly literally until Virgile Rossel’s non-literal translation of the *Swiss Civil Code*¹⁸⁹ from its original German to French in 1907 to much

¹⁸⁴ Alyssa Charles-Green, ‘Law Translation: A Self-Defence Case Study’ (2019) 25 *Comparative Law Journal of the Pacific* 179, 183.

¹⁸⁵ See, eg, Giuliana Garzone, ‘Legal Translation and Functionalist Approaches: A Contradiction in Terms?’ in *La Traduction Juridique: Histoire, Théorie(s) et Pratique [Legal Translation: History, Theories and Practice]* (Association suisse des traducteurs, terminologues et interprètes [Swiss Association of Translators, Terminologists and Interpreters], 2000) 395, 395.

¹⁸⁶ *Ibid* 396.

¹⁸⁷ Solan (n 144) 283. See also *Simutenkov v. Ministerio de Educación y Cultura* (C-265/03) [2005] ECR I-2579, I-2604 – I-2606.

¹⁸⁸ Mohun and Roberts (n 1) 22, 42–43.

¹⁸⁹ *Schweizerisches Zivilgesetzbuch* [Swiss Civil Code] (Switzerland).

criticism.¹⁹⁰ Rossel argued in favour of a natural translation which emphasised clearly communicating the text's meaning to the French-speaking population of Switzerland over preserving the exact syntax and terminology, believing that this approach was key in upholding the principal of fidelity. This fierce rejection of translational literalism, the theory that any text can – and, according to literalists, should – be translated to the literal word, with no interpretation on the part of the translator, was the first of many throughout the century which can be studied to analyse the modern approach to legal translation. Canada, for example, treats legal texts in both official languages, English and French, as equally authentic,¹⁹¹ and was forced to seriously consider its translatable approaches due to the contrast between the common-law of its English-speaking provinces, and the civil law demanded by the culturally and linguistically French population of Quebec.¹⁹² In doing so, Canada outlined its natural approach to legal translation, including reversing its initial literal approach which restricted any functional input from the translator and instead permitting the translator, now considered a co-drafter,¹⁹³ to re-word and delete superfluous or otherwise out of place text in translating the source text, so long as fidelity is preserved.¹⁹⁴ This approach has been considered widely successful in the eyes of Canada's Parliament and Supreme Court as well as the wider linguistics community,¹⁹⁵ and in light of such reforms, linguistic scholars now accept that fidelity is concerned with maintaining an "equivalent impact on the target reader, which may justify substantial changes to the original text".¹⁹⁶

Application of the 'natural' translational approach can, of course, be seen throughout much of the modern statutory interpretation principles which emphasise contextual interpretation over literal and

¹⁹⁰ Susan Sarcevic, *New Approach To Legal Translation* (Kluwer Law International, 1st Edition, 1997) 36–37; Charles-Green (n 185) 183.

¹⁹¹ *Official Languages Act*, RSC 1985, c 31, s 2.

¹⁹² Susan Sarcevic, 'Creativity in Legal Translation: How Much Is Too Much?' in *Translation in Context: Selected Contributions from the EST Congress, Granada, 1998* (John Benjamins Publishing, 2000) 281, 282–284; Rafat Y Alwazna, 'Important Translation Strategies Used in Legal Translation: Examples of Hooper's Translation of the Ottoman Majalla into English' in *The Ashgate Handbook of Legal Translation* (Routledge, 2016) 237, 240.

¹⁹³ A development which lends credence to the constitutional approach considered in the prior subsection, as well as the multidisciplinary approach to Rules as Code put forward by various scholars in the literature discussed in Section II: See, eg, Mohun and Roberts (n 1) 23.

¹⁹⁴ Sarcevic (n 193) 287.

¹⁹⁵ Alwazna (n 193) 240; Sarcevic (n 193) 290.

¹⁹⁶ Malcolm Harvey, 'What's so Special about Legal Translation?' (2002) 47(2) *Meta: Journal des traducteurs* [*Meta: Translators' Journal*] 177, 180.

technical,¹⁹⁷ though applying the empowerment of the modern legal translator to edit or outright remove sections of superfluous text can be applied particularly to coding exercises. Indeed, in a discipline in which optimisation is of great importance,¹⁹⁸ and within the context of an interview-styled application which requires user input at each question of fact,¹⁹⁹ the opportunity to remove lengthy chunks where the consequent code would remain functionally and legally equivalent to its pre-edited state is particularly enticing.

In applying this strategy to the presently considered application, consideration was placed on sections 133 and 131 of the *National Credit Act*, which, as outlined in Section IV, share a number of similarities. Specifically, both sections prescribe licensee prohibitions which are conditional upon the contract being unsuitable for the consumer,²⁰⁰ and, to this end, define when this will be the case.²⁰¹ It is the latter which is largely identical between the two, with only minor differences, and thus, rather than waste both computational power and user time by running through each check independent of one another, the application was “re-worded” to remove superfluous text, much as a translator might do so modern linguistics norms. Specifically, in the updated application, the checks to determine whether a contract is factually suitable have been removed from both the s131 and s133 functions, and instead placed into a separate ‘isUnsuitable’ function which is called within the aforementioned functions, as in Figures 6 & 7. Note that the ‘inUnsuitable’ function is always called in s131 but is only called in s133 if the user has indicated that the answers to the prompts would change if they were in relation not to the assessment day,²⁰² but the credit day.²⁰³

¹⁹⁷ See, eg, *Project Blue Sky v Australian Broadcasting Authority* (1998) 194 CLR 355, 384; *Sanson* (n 55) 62–67.

¹⁹⁸ Kurt Guntheroth, *Optimized C++: Proven Techniques for Heightened Performance* (Centre for Alternative Economic Policy Research, 2016) 6–9 (*‘Optimized C++’*). It is noted that the optimisation referred to here is that done appropriately, as opposed to over-optimisation.

¹⁹⁹ See the methodology outlined in Section III.

²⁰⁰ *National Consumer Credit Protection Act 2009* ss 131(1), 133(1).

²⁰¹ *Ibid* ss 131(2)-(4), 133(2)-(5).

²⁰² As specified in s 131(1).

²⁰³ As specified in s 133(1).

```

isUnsuitableVars = isUnsuitable(contract, consumer, licensee, assessment.day)
contract = isUnsuitableVars[0]
consumer = isUnsuitableVars[1]

contract.askSuitabilityAgain = bool_input("Between the assessment day (%s) and the day the "
    "contract was entered into or the credit limit was "
    "increased (%s), would the response to any of the "
    "immediately previous checks have changed?"
    %(assessment.day.strftime('%d %b %Y'),
      contract.creditDay.strftime('%d %b %Y'))))

```

Figure V-1 – A chunk within the s131 function which checks the suitability of the contract for the consumer. *Compatible with Python 3. This code was developed by the author of the present article.*

```

if contract.askSuitabilityAgain == True:
    isUnsuitableVars = isUnsuitable(contract, consumer, licensee, contract.creditDay)
    contract = isUnsuitableVars[0]
    consumer = isUnsuitableVars[1]

```

Figure V-2 – A chunk within the s133 function which checks the suitability of the contract for the consumer if the user has indicated that the result may differ from the check in s131. *Compatible with Python 3. This code was developed by the author of the present article.*

Beyond the timeframe at which suitability is considered, both section' unsuitability checks also differ in their respective subsections (3A)(b) which query whether the consumer has been a debtor under two or more other small amount credit contracts in the 90-day period prior to either the time of assessment²⁰⁴ or the credit day.²⁰⁵ To account for minor differences such as these, the relevant date was passed as an argument to the 'isUnsuitable' function based on which section the function is being called by. Compare the final argument provided in the function calls in Figures 6 & 7, being 'assessment.day' and 'contract.creditDay' respectively, and note how these arguments are used in the 'isUnsuitable' function in Figure 8.

```

def isUnsuitable(contract, consumer, licensee, relevantDate):

# ... [Irrelevant lines removed]

    consumer.debtorUnder2SmallAmountIn90 = bool_input(" %s was a debtor under 2 or more other "
    "small amount credit contracts between "
    "%s and %s " %(consumer.name,
    (relevantDate -
    timedelta(days=90)).strftime('%d %b %Y'),
    relevantDate.strftime('%d %b %Y'))))

```

Figure V-3 – A chunk within the 'isUnsuitable' function which uses the 'relevantDate' argument. *Compatible with Python 3. This code was developed by the author of the present article.*

²⁰⁴ As specified in s 131(3A)(b).

²⁰⁵ As specified in s 133(3A)(b).

Perhaps most liberating of the lessons learned from multilingual legislation is that posed by Mannoni²⁰⁶ elaborating on Popovič's theory of prototexts and metatexts,²⁰⁷ which argues that the product arising from the translation of any text, including one of a legal nature, is an entirely new text (the "metatext") whose sole author is the translator.²⁰⁸ Mannoni's path toward this conclusion involves a rejection of translational literalism, and in arguing against the notion, Mannoni illustrates several translations of a clause deploying various levels of literalism and non-literalism.²⁰⁹ Interestingly, Mannoni's finding that only non-literal translations accurately represent the text mirrors this article's finding that a strictly formalist approach is simply incompatible with much of the current law. Indeed, reminiscent to the present findings, Mannoni argues in favour of "abandoning the old cliché on free vs. literal translation",²¹⁰ and instead placing emphasis on legal translation as the production of a new metatext as opposed to a mere copy of the source text, a push which is common amongst much of the modern legal linguistics literature.²¹¹ Such scholars rally behind Šarčević's proposal that the fidelity of a legal translation should be measured not by its correspondence to the source text, but by the correspondence of its legal effect to that of its source text's.²¹²

The notion of the metatext, if accepted, has significant repercussions for the deployment of RaC applications. Firstly, Mannoni's argument that no two translations are identical and that ambiguity is inherent in the translation process does not bode well for parties hoping for a standardised approach to digitising legislation or Ainsworth's stated goal of functional equivalence in translation as first touched upon in Section II.²¹³ Nonetheless, the existence of a metatext as a brand new text whose translator is

²⁰⁶ Michelle Mannoni, 'Challenging the Existence of Legal Translation: A Comprehensive Translation Theory' (2016) 26 *Comparative Legilinguistics: International Journal for Legal Communication* 99.

²⁰⁷ Anton Popovič, 'Aspects of Metatext' [1976] *Canadian Review of Comparative Literature* 225; Anton Popovič, *La Scienza Della Traduzione: Aspetti Metodologici, La Comunicazione Traduttiva* [The Science of Translation: Methods and Translation as a Form of Communication], tr Bruno Osimo (Casa Editrice Hoepli, 1975).

²⁰⁸ Mannoni (n 207) 112; Popovič, 'Aspects of Metatext' (n 208) 226–227.

²⁰⁹ Mannoni (n 207) 109–110.

²¹⁰ *Ibid* 121.

²¹¹ See also Harvey (n 197) 180–181; Nicholas Kasirer, 'François Génys's *Libre Recherche Scientifique* as a Guide for Legal Translation' (2001) 61(2) *Louisiana Law Review* 331, 341; Matt Hammond, 'A New Wind of Quality from Europe: Implications of the Court Case Cited by Holz-Mänttari for the U.S. Translation Industry' in *Translation and the Law* (John Benjamins Publishing) 233, 238–239.

²¹² Sarcevic (n 191) 71, 112; See also Harvey (n 197) 181.

²¹³ Ainsworth (n 82) 43.

the sole author goes hand-in-hand with the process outlined in subsection A, in which multilingual legislation is made up not of ‘interpretations’ of the original text, but of a number of equally authoritative texts all co-authored by the translator and legislature. It is this latter philosophy which is most necessary in dealing with the inherently multidisciplinary nature of translating complex legal texts to logically flawless code.

VI CONCLUSIONS

This article sought to explore how RaC applications might be developed and deployed in a manner which is compatible with the interpretative role of the Australian judiciary by developing an application which evaluates compliance with respect to select provisions of the *National Credit Act*. Section II provided a review of the literature surrounding computational law, the formalist nature of code, and the ways in which RaC, and analogous multilingual legislation, navigate the judicial-legislative divide, while Section III outlined the methodologies purported to be tested as well as the technical considerations. Section IV explored the findings and shortcomings of these proposed methods and argued that a strictly formalist or non-formalist approach was not sufficient in developing or describing RaC. In light of the failure to fully embrace a formalist or non-formalist alignment, Section V proposed an alternative approach, that being consideration of the lessons learned in multilingual jurisdictions, with particular focus toward the elements of equality and fidelity from the source text to the translation and how this might influence RaC development. Through this lens, it is put forward that one avenue through which RaC applications could be developed without disrespecting the role of the judiciary is to acknowledge the inherent authorship a translator holds over a legal translation; accepting the process of statute translation not as an interpretation of pre-existing legal texts, but as a collaborative drafting process between the legislature and the translatable body which need not be syntactically or idiomatically literal, much as multilingual jurisdictions such as the EU and Canada currently do.

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