**RULES AS CODE AND THE INTERPRETATIVE ROLE OF THE JUDICIARY**

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I INTRODUCTION

This article seeks to explore how the Rules as Code (“RaC”) concept 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[[1]](#footnote-1) 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 the judicial power of interpretation to programmers and discourage the drafting of discretionary clauses in order to accommodate digital conversion. To this end, methods of encoding ambiguous clauses in Chapter III of the *National Consumer Credit Protection Act* (“*National Credit Act”*)[[2]](#footnote-2) were 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, with particular reference to the manners in which the resultant application[[3]](#footnote-3) changed from that initially proposed. Section V posits that, in light of the project’s findings, alternative approaches might be better suited than that of the formalist vs non-formalist one initially proposed, 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

A *Literature Review*

This section seeks to outline and critique the relevant literature surrounding Rules as Code. 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 powers, drawing analogies to multilingual legislation.

A *Computational Law*

A significant number of legal systems throughout history have had computational potential: the earliest preserved legal code, the Code of Ur-Nammu, was made up almost entirely of ‘If’ statements,[[4]](#footnote-4) while co-father of calculus, Gottfried Leibniz, famously pursued a precise method of interacting with the law in computational terms.[[5]](#footnote-5) Late 20th Century attempts at realising this potential through development of a normalised process of legal drafting, such as that hypothesised by Allen & Engholm[[6]](#footnote-6), are considered the origins of the field now known as computational law.[[7]](#footnote-7)

In the 1980s, efforts such as that of Sergot et al.[[8]](#footnote-8) helped push the field forward by taking the theory of their predecessors and converting an actual piece of legislation, the *British Nationality Act,*[[9]](#footnote-9) into code through standardised syntax and logical relationships. Here, some initial discrepancies between the technical capabilities of code and semiotics were initially highlighted, for example, the tendency of a machine to assume an unanswered Boolean query to have a ‘false’ value by default conflicting with the natural human understanding of ‘unknown’.[[10]](#footnote-10) Further, Leith critiques the logic used by Sergo et al. in their conversion,[[11]](#footnote-11) and questions whether a purely logical reading of the legislation is truly representative of the judiciary’s interpretation process,[[12]](#footnote-12) though the extra-curial words of French CJ would indicate this concern is unfounded in Australia.[[13]](#footnote-13) 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.[[14]](#footnote-14) Genesereth notes that Sergo et al.’s limitations became manageable by the turn of the century,[[15]](#footnote-15) 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,[[16]](#footnote-16) as well as the inherent formalist nature of algorithms.[[17]](#footnote-17) Genesereth’s conclusion is that despite these limitations, RaC is still ‘the next step in the evolution of legal system’ 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, Wolfram[[18]](#footnote-18) advocates for a natural language approach which would involve the manual classification of objects and legal concepts,[[19]](#footnote-19) while courts in the United States have adopted machine-learning techniques to assist in tasks such as recidivism prediction.[[20]](#footnote-20) Ultimately, however, initial efforts in developing an RaC framework have operated within a deterministic ‘If *x,* then *y*’ logic.[[21]](#footnote-21)

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.[[22]](#footnote-22) In light of the Hayne Royal Commission[[23]](#footnote-23) and Westpac’s ongoing dispute with AUSTRAC,[[24]](#footnote-24) 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.[[25]](#footnote-25) 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 are proprietarily protected and therefore cannot be checked by external legal experts.[[26]](#footnote-26) It is therefore no surprise that the Rules as Code initiative is being pursued in a variety of forms worldwide,[[27]](#footnote-27) 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,[[28]](#footnote-28) Liu, Lin & Chen[[29]](#footnote-29) and Larson et al.[[30]](#footnote-30) 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,[[31]](#footnote-31) or, in the case of rules engines, ignoring the constantly evolving nature of social norms by programming the law statically according to the norms at the time.[[32]](#footnote-32) A 2017 investigation conducted by *ProPublica* found significant racial bias in the conclusions of COMPAS,[[33]](#footnote-33) an algorithm employed by various courts in the United States to assist judges in predicting recidivism, despite no explicit referral to race in the algorithm itself.[[34]](#footnote-34) Such unintentional biases, scholars argue, result from the correlation of race with variables such as socioeconomic status,[[35]](#footnote-35) 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,[[36]](#footnote-36) a normative theory of jurisprudence encouraging strict adherence only to the law, as opposed to contextual or heuristic considerations (TODO THIS IS A GENERALISATION).[[37]](#footnote-37) Indeed, formalism has been described numerous times as the ‘autonomous’ theory of adjudication.[[38]](#footnote-38) McIntrye corroborates this notion in his critique of digital government, highlighting the dangers of discouraging judicial discretion clauses for the sake of accommodating RaC[[39]](#footnote-39) and disparagingly comparing such hypothetical legislation to the early Napoleonic Code[[40]](#footnote-40) which stripped the judiciary of any law-making powers.[[41]](#footnote-41)

Though the modern debate between legal formalism and its arguable antithesis, legal realism, began in 1905 with Justice Holmes’ dissent in the US Supreme Court’s (“USSC”) *Lochner v New York,*[[42]](#footnote-42)[[43]](#footnote-43)the issue hit Australian shores ten years later when Chief Justice Dixon proclaimed that ‘there is no safer guide to judicial decisions in significant conflicts than a strict and complete legalism.’[[44]](#footnote-44) While the statement’s context as well as decisions[[45]](#footnote-45) and statements[[46]](#footnote-46) throughout Dixon CJ’s career would suggest he was speaking specifically with regard to federal disputes and arguably not endorsing American legal formalism,[[47]](#footnote-47) his words would influence the Australian legal community toward the philosophy for much of the 20th Century.[[48]](#footnote-48) Presently, however, the vast majority of Australian jurists note that by the nature of its legal system, the Australian judiciary must adhere to a relatively heuristic, non-formalist jurisprudence.[[49]](#footnote-49) [TODO Page 66 of Stat Interp Book] Justice Kirby, argues that ‘real’ judges must operate from a place which is ‘neither wholly mechanical, nor excessively creative’,[[50]](#footnote-50) corroborating the notion 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.[[51]](#footnote-51) Matczak argues that because formalism leads to outcomes which are unpredictable in the context of societal norms,[[52]](#footnote-52) it is therefore incompatible with the rule of law.[[53]](#footnote-53) He illustrates this with the semantics-concerned case of *Smith v United States,*[[54]](#footnote-54) 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.[[55]](#footnote-55)

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

The former can be illustrated through *Nix v Hedden* (“*Nix*”),[[56]](#footnote-56) 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 a vegetable, it would be included in the tariff on vegetable imports, [[57]](#footnote-57) aligning itself with the ‘realists’.[[58]](#footnote-58) 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,[[59]](#footnote-59) 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. TODO THIS MIGHT BE BETTER IN ANALYTICAL SECTION



**Figure 1** – A formalist vs non-formalist approach to Nix v Hedden. Compatible with Python 3.

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 comparison[[60]](#footnote-60) 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.[[61]](#footnote-61) Here, the OECD failed to recognise that just as they expect RaC to influence lawmakers toward reducing logical inconsistencies in their drafting,[[62]](#footnote-62) 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 Rules as Code have further tried to soothe concerns by indicating that Rules as Code could be limited to solely prescriptive and unambiguous legal texts.[[63]](#footnote-63) 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 industry[[64]](#footnote-64) which provides the bulk of ‘RegTech’ work.[[65]](#footnote-65)

At current, the notion of a truly non-formalist Rules as Code 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,[[66]](#footnote-66) 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 (“SoP”). Chapter three of the *Commonwealth Constitution*[[67]](#footnote-67) (“the *Constitution*”) vests the judicial power of the Commonwealth in the federal courts,[[68]](#footnote-68) extending to Australia the separation of the executive and judicial, considered by many to have originated in 1607’s *Case of Prohibitions,* in which Chief Justice Edward Coke wrested the judicial power, including that of interpreting the law, from King James I.[[69]](#footnote-69) Such a partition between the powers of the judiciary and the remaining arms of government is a cornerstone of fair Australian governance free of arbitrary exercise of power,[[70]](#footnote-70) and has found confirmation in the common law throughout the 20th Century, beginning with *New South Wales v Commonwealth.*[[71]](#footnote-71) It is therefore worth exploring whether the act of converting legal texts into code would, in fact, 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 SoP.

Amongst the literature addressing digital government, little has yet considered the relationship between the hypothetical programmer 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’,[[72]](#footnote-72) including its possible effects on ‘existing constitutional principles around the separation of powers’,[[73]](#footnote-73) though the project’s findings are yet to release.[[74]](#footnote-74) 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’[[75]](#footnote-75) 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.[[76]](#footnote-76)

Additional parallels can be seen in analysing theories of multilingual legal translation principles. For instance, Ainsworth[[77]](#footnote-77) 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 decisions[[78]](#footnote-78) and Ainsworth’s finding of the predominate approach being one of ‘purposive interpretation’,[[79]](#footnote-79) 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 Rules as Code.

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,[[80]](#footnote-80) and thus, one might expect the same SoP 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,[[81]](#footnote-81) the Directorate-General for Translation,[[82]](#footnote-82) and has affirmed an equal legal authority across all translations.[[83]](#footnote-83) 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.

III METHODOLOGY

This project will compare two methods of converting specific provisions of Chapter III of the *National Credit Act* into a Rules as Code format and analyse which aspects of each method better respect the interpretative role of the judiciary. Method one seeks to adhere to the formalistic methods analysed by Genesreth[[84]](#footnote-84) and Sergo et al.[[85]](#footnote-85) and is most reminiscent of the methods put into place in recent RaC efforts.[[86]](#footnote-86) 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, method two acknowledges the inherent formalism of algorithms, but strives to simulate the non-formalistic approach hypothesised by Green & Viljoen[[87]](#footnote-87) and Matczak[[88]](#footnote-88) through consideration of quasi-legislative materials and manual classification techniques explored by Wolfram.[[89]](#footnote-89) It is expected that this method’s outputs will be more predictable and therefore more ‘just’[[90]](#footnote-90) than that of method one, 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 methods envisioned in the analysis is exemplified above in Figure 1. [TODO Note that there are a number of varying interpretations of what ‘formalist’ or ‘non-formalist’ theories actually mean – for the purposes of this exercise, the generally accepted aspects of formalism are considered, these being an emphasis on strict interpretation of the technical meaning of the law with adherence only to authorised legal materials]

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 discretionary decisions in the form of case law[[91]](#footnote-91) which suggest a non-formalist alignment,[[92]](#footnote-92) allowing for a full exploration of digital conversion techniques which previous literatures have failed to consider.[[93]](#footnote-93) 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.[[94]](#footnote-94) This guidance is neither exhaustive, nor does it guarantee compliance,[[95]](#footnote-95) and as such, its use allows for a consideration of the effects of a legal realist’s 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]’ [[96]](#footnote-96) is reminiscent of the legal realist’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.[[97]](#footnote-97) This is deemed particularly important in developing an RaC application so as to avoid opacity arising from technical illiteracy.[[98]](#footnote-98)

Code is to be written in an interview style, similar to that utilised by the Australasian Legal Information Institute’s (“AustLII”) ‘ElectKB’ application,[[99]](#footnote-99) which questions users through a chat-like interface before generating a finding on their eligibility as a member of federal parliament under the *Commonwealth Electoral Act 1918* (Cth).[[100]](#footnote-100) To address concerns raised by Sergo et al. regarding the historical lack of an ‘unknown’ option in Boolean programs,[[101]](#footnote-101) the Python module ‘tribool’[[102]](#footnote-102) is used and adapted so as to emulate ternary unknown-state logic (True, False or Unknown).[[103]](#footnote-103) Influenced by Wolfram’s advocacy for classification-based programming,[[104]](#footnote-104) 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,[[105]](#footnote-105) the general concepts of a variable’s class, object, and attribute hierarchy[[106]](#footnote-106) 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, and thus more aligned with non-formalism than formalism. Nonetheless, for reasons outlined below, this approach 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 and inputs which generally took the form of ternary unknown-state logic,[[107]](#footnote-107) dates,[[108]](#footnote-108) or values sans units.[[109]](#footnote-109) 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.



**Figure 2 –** 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.

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.



**Figure 3** – 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 if 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 regulations[[110]](#footnote-110) to “prescribe particular situations in which a credit contract is taken not to be unsuitable for a consumer”.[[111]](#footnote-111) 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 relevant explanatory memoranda,[[112]](#footnote-112) 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.

A similar example arose out of s133(6), which prescribes a criminal penalty of two years imprisonment where a ‘person’ subject to s133(1)[[113]](#footnote-113) engages in conduct[[114]](#footnote-114) which contravenes s133(1).[[115]](#footnote-115) Given that, for the purposes of the Act, a ‘person’ need not be a natural person[[116]](#footnote-116) 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):[[117]](#footnote-117)

**(1)**

Where:

* = 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.[[118]](#footnote-118)

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). This interpretation might seem counterintuitive and at odds with Parliament’s intent,[[119]](#footnote-119) as it functionally punishes licensees who conduct insufficient assessments moreso than those who conduct no assessment whatsoever.[[120]](#footnote-120) Despite this, when such facts came before the Federal Court in *Australian Securities and Investments Commission v Cash Store Pty Ltd (in liquidation)*[[121]](#footnote-121)(“*Cash Store*”) the licensees, who had failed to make any preliminary assessments, were found to have breached ss128-130, but not s131.[[122]](#footnote-122) 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.

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**Figure 4 –** In consistence with the Cash Store judgement, s131 is only evaluated where a relevant assessment exists.

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.

In the case of the non-formalist approach, it was found that presence of discretionary clauses posed computational problems outside of the scope of this article through incompatibility with the calculative and deterministic nature of algorithms first raised in Section II,[[123]](#footnote-123) 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,[[124]](#footnote-124) through calculating the weighted sum of all possible non-formalist considerations[[125]](#footnote-125) against a given threshold. This method, much like the neural networks of machine learning,[[126]](#footnote-126) emulates the process by which neurons in a brain are activated based on a series of weighted binary inputs,[[127]](#footnote-127) 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.

**(2)**

Where:

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



**Figure 5 –** 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’.

It soon became apparent, however, that no practicable method of determining acceptable weightings and thresholds could be justifiably produced with any academic or legal justification within the scope of this article. Nonetheless, it is put forward that such efforts would be well-suited in further RaC research. Specifically, such attempts at quantifying legal discretion harken to the limited but relevant literature surrounding attempts to quantify ‘reasonable doubt’ in criminal trials,[[128]](#footnote-128) and it is posited that further investigation could produce methods supported by academic and legal justification.

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 facets of formalism.[[129]](#footnote-129) 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.”[[130]](#footnote-130) 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,[[131]](#footnote-131) broader questions would need consideration 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.

V AN ALTERNATIVE APPROACH: MULTILINGUAL LEGISLATION

Absent a clear solution stemming from comparisons of formalism and non-formalism-influenced coding, it proposed, as alluded to in Section II, that analysing the approaches taken in jurisdictions with multilingual legislation could bare more positive findings. Concerning multilingual drafting in the context of a supranational regime such as the EU, Solan[[132]](#footnote-132) identifies three goals: equality of language, fidelity in interpretation and efficiency of translation.[[133]](#footnote-133) 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 declaration that all translations of a law hold equal authority,[[134]](#footnote-134) 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 languages[[135]](#footnote-135) 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,[[136]](#footnote-136) 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. [TODO outline how some current attempts might compare with standard legislation].

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’ application[[137]](#footnote-137) gathers information and draws conclusions surrounding an individual’s eligibility as a member of federal parliament*.*[[138]](#footnote-138) 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,[[139]](#footnote-139) 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.[[140]](#footnote-140) 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,[[141]](#footnote-141) 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’,[[142]](#footnote-142) might arguably be considered ‘binding’, with a caveat. Strictly, the Full Federal Court majority held in *Pintarich v Deputy Commission of Taxation*[[143]](#footnote-143) (“*Pintarich*”)that a binding decision cannot be made without a mental process on the part of the authorised officer,[[144]](#footnote-144) 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.[[145]](#footnote-145)

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 never be taken to have binding outputs 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*[[146]](#footnote-146)(“*Semunigus*”)and accepted on appeal to the Full Federal Court,[[147]](#footnote-147) was misapplied because its establishment in *Semunigus* lacked the context of intelligent, algorithmic decision-making systems, such as the system in question in *Pintarich*.[[148]](#footnote-148) Justice Kerr further argued that in light of the increasing prevalence of such systems, the majority’s decision promoted unfairness administrative uncertainty,[[149]](#footnote-149) and while the majority agreed that the outcome could lead to these unwelcome results,[[150]](#footnote-150) they justified it by claim that such circumstances were “quite unusual” and “unlikely to arise very often”.[[151]](#footnote-151) While the High Court refused the opportunity to consider this,[[152]](#footnote-152) the majority’s decision has been widely criticised for denying the growing dominance of automation in administrative decision-making,[[153]](#footnote-153) and given the vast majority of automated systems in administrative decision-making at present,[[154]](#footnote-154) it seems unlikely that the *Pintarich* decision should be taken to apply to all automated decisions.[[155]](#footnote-155) Interestingly, the Australian Taxation Office appeared to distance itself from such a broad precedent, noting in the case’s Decision Impact Statement[[156]](#footnote-156) 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.”[[157]](#footnote-157)

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.[[158]](#footnote-158) As highlighted in Section II, the SoP is arguably present within the EU’s constitutional framework, given that the power to interpret treaties is vested in its courts,[[159]](#footnote-159) just as the federal courts of Australia enjoy the power to interpret Commonwealth legislation.[[160]](#footnote-160) 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,[[161]](#footnote-161), an executive body,[[162]](#footnote-162) they are technically drafted and published by the Council of the European Union and the European Parliament, bodies of the legislature,[[163]](#footnote-163) in a process which blurs the SoP. In a departure from the analogy to Australia’s constitutional framework, however, the executive body of the EU, the European Commission, also operates as a legislative body and holds the sole right to legislative initiation.[[164]](#footnote-164) 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,[[165]](#footnote-165) would upset this argument. If then, the process of legislative translation in the EU is taken 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 SoP is upheld.

Similarly, in an Australian context considering RaC in the place of multilingual legislation, while the executive is forbidden from creating law,[[166]](#footnote-166) 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 SoP.[[167]](#footnote-167) 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. Despite the EU’s principal of lingual equality in law, early CJEU cases would, at times, preference original legislative drafts over their translations.[[168]](#footnote-168) *Stauder v City of Ulm*,[[169]](#footnote-169) 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.[[170]](#footnote-170) 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 of its members.[[171]](#footnote-171) 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.[[172]](#footnote-172) Indeed, identifying an RaC application as legally inferior to standard legislation could allow it to be deemed ‘delegated legislation’ as prepared by a body of the executive, as opposed to a ‘copy’ and, therefore, interpretation of the given act,[[173]](#footnote-173) and in this sense, avoid breaching or blurring the SoP beyond those breaches which are already present in the numerous regulations prescribed by administrative bodies.

* Advisory would solve the efficiency and multiple interpretation issues set by the status quo (multiple private solutions)
  + Influential would be largely useless in the context of the NCCP Act, given how rarely disputes reach the courts
  + Binding would be most beneficial from an efficiency standpoint, but obviously raises most legal concerns and requires minimal assumptions
* ^^^ Obviously the outputted conclusions of such a system could only be binding so far as the inputs relied upon are accurate. – Is a decision still binding where the facts relied upon are false? TODO

B *Fidelity*

In maintaining fidelity throughout the coding process, a combination of the modern approach to statutory interpretation,[[174]](#footnote-174) embodied in *Project Blue Sky v Australian Broadcasting Authority*[[175]](#footnote-175)(“*Project Blue Sky”*)

TODO Courts generally cannot provide advice without cause (find authority), however, UK courts have overridden this[[176]](#footnote-176)

* ~~Augustinian interpretation (Using multiple versions of the same law) is popular in multilingual interpretation, but cannot really apply to Australian rules as code.~~

VI CONCLUSIONS

~~This programming approach was consistent with the judicial decision-making process deployed in Chapter III determinations by emulating the object-oriented approach taken in~~ *~~Australian Securities and Investments Commission v Westpac Banking Corporation,[[177]](#footnote-177)~~* ~~in which it was held that, contrary to the primary judge’s view,[[178]](#footnote-178) an ‘assessment’ for the purposes of Division 3[[179]](#footnote-179) was a legal construct that persisted across provisions regardless of whether it was valid~~

* ~~Australia has embraced a non-formalist legal approach by the very nature of its common law system and the modern approach to statutory interpretation, and this has extended beyond the judiciary to the legislature as well.~~
* ~~Much of the law of the Commonwealth, including the NCCP Act, is written in a way which is simply incompatible with the absolute formalist who abides by the notion that the role of the courts is simply to be the mouthpiece of the law.~~
* ~~This became apparent ear~~

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15. 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>. [↑](#footnote-ref-15)
16. Ibid 6. [↑](#footnote-ref-16)
17. Ibid 5–6. [↑](#footnote-ref-17)
18. Wolfram (n 5). [↑](#footnote-ref-18)
19. 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. [↑](#footnote-ref-19)
20. 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. [↑](#footnote-ref-20)
21. 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/>. [↑](#footnote-ref-21)
22. 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>. 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’). [↑](#footnote-ref-22)
23. Commonwealth, Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry, *Final Report* (2019). [↑](#footnote-ref-23)
24. ‘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. [↑](#footnote-ref-24)
25. 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. [↑](#footnote-ref-25)
26. TODO EXPAND ON THIS BY UNPACKING LOOMIS 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). [↑](#footnote-ref-26)
27. Ibid 68–69. See also Government Information Services (n 21); 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+-+Maschinenverst%C3%A4ndlich+und+automatisierbar>. [↑](#footnote-ref-27)
28. Sonja Starr, ‘Evidence-Based Sentencing and the Scientific Rationalization of Discrimination’ (2014) 66(4) *Stanford Law Review* 803. [↑](#footnote-ref-28)
29. Liu, Han-Wie, Ching-Fu Lin and Yu-Jie Chen (n 17). [↑](#footnote-ref-29)
30. 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/datastore/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>. [↑](#footnote-ref-30)
31. Starr (n 28) 836–837. [↑](#footnote-ref-31)
32. TODO [↑](#footnote-ref-32)
33. Jeff Larson et al, (n 27); Angwin, Julia and Jeff Larson (n 27). [↑](#footnote-ref-33)
34. Northpointe, ‘Practitioner’s Guide to COMPAS Core’ (Guidance, Northpointe, 19 March 2015) 29. [↑](#footnote-ref-34)
35. Starr (n 28) 837–838. [↑](#footnote-ref-35)
36. Genesereth (n 15) 5. [↑](#footnote-ref-36)
37. *West’s Encyclopedia of American Law* (online at 25 August 2020) ‘formalism’. [↑](#footnote-ref-37)
38. 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.ctvjk2w91.4>; 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. [↑](#footnote-ref-38)
39. 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>. [↑](#footnote-ref-39)
40. *Code civil des français* [Civil code of the French] (France). [↑](#footnote-ref-40)
41. Ibid art 5. [↑](#footnote-ref-41)
42. TODO REF TO SUPPORT THIS STATEMENT [↑](#footnote-ref-42)
43. 198 US 45 (1905). [↑](#footnote-ref-43)
44. “Swearing in of Sir Own Dixon as Chief Justice” (1952) 85 CLR xi, xiv. [↑](#footnote-ref-44)
45. See, eg, *Australian National Airways Pty Ltd v Commonwealth (No 1) (‘Airlines Nationalisation case’)* (1945) 71 CLR 29. [↑](#footnote-ref-45)
46. 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. [↑](#footnote-ref-46)
47. Justice Michael Kirby, ‘“Judicial Activism”? A Riposte to the Counter-Reformation’ 11 *Otago Law Review* 1, 3–4. [↑](#footnote-ref-47)
48. 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. [↑](#footnote-ref-48)
49. Justice Michael Kirby (n 47) 4–8, 13–16. [↑](#footnote-ref-49)
50. Ibid 13. [↑](#footnote-ref-50)
51. See, eg, Marcin Matczak, ‘Why Judicial Formalism Is Incompatible with the Rule of Law’ [2016] *SSRN Electronic Journal*. [↑](#footnote-ref-51)
52. Ibid 21–25. [↑](#footnote-ref-52)
53. 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/>. [↑](#footnote-ref-53)
54. *Smith v United States* 508 US 223 (1993). [↑](#footnote-ref-54)
55. Ibid 242–247. [↑](#footnote-ref-55)
56. 149 US 304 (1893). [↑](#footnote-ref-56)
57. Ibid 306-307. [↑](#footnote-ref-57)
58. Matczak (n 51) 22–24. [↑](#footnote-ref-58)
59. Wolfram (n 5) 156–159. [↑](#footnote-ref-59)
60. McIntyre (n 39). [↑](#footnote-ref-60)
61. Mohun and Roberts (n 1) 26. [↑](#footnote-ref-61)
62. Mohun and Roberts (n 1). 42-45. [↑](#footnote-ref-62)
63. Ibid 26, 104; ‘Rules as Code – Test, Learn, Repeat’, *Digital.NSW* <https://www.digital.nsw.gov.au/article/rules-code-test-learn-repeat>. [↑](#footnote-ref-63)
64. 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. [↑](#footnote-ref-64)
65. Schizas et al (n 22) 12, 18, 25, 34. [↑](#footnote-ref-65)
66. See, eg, 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 <http://dl.acm.org/doi/10.1145/3351095.3372840> for an investigation into the evolution of computer science with analogy to the US legal system’s growth from formalism to realism. [↑](#footnote-ref-66)
67. *Commonwealth of Australia Constitution* [↑](#footnote-ref-67)
68. *Commonwealth of Australia Constitution* s 71. [↑](#footnote-ref-68)
69. *Case of Prohibitions EWHC KB J23* (1607) 77 ER 1342. [↑](#footnote-ref-69)
70. AR Blackshield, *Australian Constitutional Law and Theory: Commentary and Materials* (Federation Press, 5th ed. abridged., 2010) 8–12 (‘*Australian Constitutional Law and Theory*’). [↑](#footnote-ref-70)
71. *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. [↑](#footnote-ref-71)
72. Mohun and Roberts (n 1) 70. [↑](#footnote-ref-72)
73. New Zealand Law Foundation, ‘Projects Funded | The Law Foundation’ <https://www.lawfoundation.org.nz/?page\_id=6882>. [↑](#footnote-ref-73)
74. Ibid. [↑](#footnote-ref-74)
75. TODO REF [↑](#footnote-ref-75)
76. 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 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 imprecise translation of a patent from English to Mandarin. Cf the two valid approaches to *Nix* seen in Figure 1. [↑](#footnote-ref-76)
77. 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 <http://www.taylorfrancis.com/books/e/9781315612706>. [↑](#footnote-ref-77)
78. 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. [↑](#footnote-ref-78)
79. Ainsworth (n 77) 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. [↑](#footnote-ref-79)
80. *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. [↑](#footnote-ref-80)
81. *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. [↑](#footnote-ref-81)
82. Directorate-General for Communication, ‘Translation’, *European Commission* <https://ec.europa.eu/info/departments/translation\_en>. [↑](#footnote-ref-82)
83. *Skatteministeriet v Aktieselskabet Forsikrinsselskabet Codan* (C-236/97) [1998] ECR I-8679. [↑](#footnote-ref-83)
84. Genesereth (n 15). [↑](#footnote-ref-84)
85. Sergot et al (n 8). [↑](#footnote-ref-85)
86. See, eg, Government Information Services (n 21) 21–24; Open Fisca (n 21). [↑](#footnote-ref-86)
87. Green and Viljoen (n 66). [↑](#footnote-ref-87)
88. Matczak (n 51) 29–34. [↑](#footnote-ref-88)
89. Wolfram (n 5) 156–159. [↑](#footnote-ref-89)
90. Matczak (n 51) 21–29. [↑](#footnote-ref-90)
91. 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). [↑](#footnote-ref-91)
92. See, eg, Davies J, *Australian Securities and Investments Commission v The Case Store (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 54) 229 which has been criticised as a strict formalist decision; Matczak (n 51) 25–28. See also Perram 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’. [↑](#footnote-ref-92)
93. Cf the unambiguous and deterministic legal questions addressed in Government Information Services (n 21) 21–24. [↑](#footnote-ref-93)
94. ‘Regulatory Guide 209: Credit Licensing: Responsible Lending Conduct’ (n 64). [↑](#footnote-ref-94)
95. Ibid r 81-83. [↑](#footnote-ref-95)
96. Ibid r 23(d). [↑](#footnote-ref-96)
97. 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>. [↑](#footnote-ref-97)
98. Jenna Burrell, ‘How the Machine “Thinks”: Understanding Opacity in Machine Learning Algorithms’ (2016) 3(1) *Big Data & Society* 1, 4. [↑](#footnote-ref-98)
99. Australasian Legal Information Institute, ‘DataLex Consultation: ElectKB’, *DataLex* <http://beta.datalex.org/app/consultation?rulebase=http%3A%2F%2Faustlii.community%2Ffoswiki%2FDataLex%2FElectKB>. [↑](#footnote-ref-99)
100. TODO Mowbray et al., “Utilising AI in the legal assistance sector”, <https://pdfs.semanticscholar.org/d461/95270980a87c74f5ac45e4f1bffc5282af4d.pdf?_ga=2.244334789.1101175616.1578402412-372167066.1578402412> [↑](#footnote-ref-100)
101. Sergot et al (n 8) 379–380. [↑](#footnote-ref-101)
102. Grant Jenks, *Tribool: Three-Valued Logic Data Type.* (online at 29 September 2020) <http://www.grantjenks.com/docs/tribool/> (‘*Tribool*’). [↑](#footnote-ref-102)
103. Jeff Connelly, ‘Ternary Computing Testbed 3-Trit Computer Architecture’ (California Polytechnic State University of San Luis Obispo, 2008) 8, 58–59 <http://xyzzy.freeshell.org/trinary/CPE%20Report%20-%20Ternary%20Computing%20Testbed%20-%20RC6a.pdf>. [↑](#footnote-ref-103)
104. Wolfram (n 5) 156–159. [↑](#footnote-ref-104)
105. Deb Armstrong, ‘The Quarks of Object-Oriented Development’ (2006) 49(2) *Communications of the ACM* 123, 123. [↑](#footnote-ref-105)
106. 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>. [↑](#footnote-ref-106)
107. 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 102). [↑](#footnote-ref-107)
108. 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>. [↑](#footnote-ref-108)
109. For example, a credit limit without a preceding currency symbol, or contract term without a preceding unit of days. [↑](#footnote-ref-109)
110. *National Consumer Credit Protection Regulations 2010* (Cth) [↑](#footnote-ref-110)
111. *National Consumer Credit Protection Act 2009* (Cth) s 133(5). [↑](#footnote-ref-111)
112. Explanatory Memorandum, National Consumer Credit Protection Bill 2009 (Cth) 109-113. [↑](#footnote-ref-112)
113. *National Consumer Credit Protection Act 2009* (Cth) s 133(6)(a). [↑](#footnote-ref-113)
114. Ibid s133(6)(b). [↑](#footnote-ref-114)
115. Ibid s133(6)(c). [↑](#footnote-ref-115)
116. See, eg, Ibid ss 5 (definition of ‘person’), 14-15, 53(3). [↑](#footnote-ref-116)
117. *Crimes Act 1914* (Cth) s 4B(2) [↑](#footnote-ref-117)
118. 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. [↑](#footnote-ref-118)
119. 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. [↑](#footnote-ref-119)
120. 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. TODO [↑](#footnote-ref-120)
121. [2014] FCA 926. [↑](#footnote-ref-121)
122. *Australian Securities and Investments Commission v Cash Store Pty Ltd (in liquidation)* [2014] FCA 926, [69], 75. [↑](#footnote-ref-122)
123. TODO [↑](#footnote-ref-123)
124. TODO for the purposes of TODO [↑](#footnote-ref-124)
125. TODO such as [RG 209 etc] [↑](#footnote-ref-125)
126. TODO [↑](#footnote-ref-126)
127. TODO [↑](#footnote-ref-127)
128. See, eg, TODO [↑](#footnote-ref-128)
129. See, eg, TODO [↑](#footnote-ref-129)
130. *Australian Securities and Investments Commission v Westpac Banking Corporation* (2020) 380 ALR 262, 296. [↑](#footnote-ref-130)
131. The possibilities and consequences of which are hypothesised in the following section. [↑](#footnote-ref-131)
132. L Solan, ‘The Interpretation of Multilingual Statutes by the European Court of Justice’ (2009) 34(2) *Brooklyn journal of international law* 277. [↑](#footnote-ref-132)
133. Ibid 279–280. [↑](#footnote-ref-133)
134. TODO [↑](#footnote-ref-134)
135. In the case of RaC, these languages can be considered ‘natural language’ and a given programming language TODO [↑](#footnote-ref-135)
136. TODO Refs [↑](#footnote-ref-136)
137. Australasian Legal Information Institute (n 99). [↑](#footnote-ref-137)
138. TODO Mowbray et al., “Utilising AI in the legal assistance sector”, <https://pdfs.semanticscholar.org/d461/95270980a87c74f5ac45e4f1bffc5282af4d.pdf?_ga=2.244334789.1101175616.1578402412-372167066.1578402412> [↑](#footnote-ref-138)
139. The *Commonwealth Electoral Act 1918* (Cth) and the *Commonwealth of Australia Constitution*. [↑](#footnote-ref-139)
140. 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>. [↑](#footnote-ref-140)
141. TODO [↑](#footnote-ref-141)
142. TODO [↑](#footnote-ref-142)
143. [2018] FCAFC 79. [↑](#footnote-ref-143)
144. TODO PINPOINT? [↑](#footnote-ref-144)
145. *Minister for Natural Resources v New South Wales Aboriginal Land Council* (1987) 9 NSWLR 154, 164 (McHugh J). [↑](#footnote-ref-145)
146. [1999] FCA 422, [19]. [↑](#footnote-ref-146)
147. *Semunigus v Minister for Immigration and Multicultural Affairs* (2000) 96 FCR 533, 536, 540, 546-547. [↑](#footnote-ref-147)
148. *Pintarich v Deputy Commission of Taxation* [2018] FCAFC 79, [46]-[50]. [↑](#footnote-ref-148)
149. Ibid, [64]-[65] [↑](#footnote-ref-149)
150. Ibid, [151]-[152] (Moshinsky and Derrington JJ). [↑](#footnote-ref-150)
151. Ibid, [152]. [↑](#footnote-ref-151)
152. *Pintarich v Deputy Commission of Taxation* [2018] HCASL 322. [↑](#footnote-ref-152)
153. 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>. [↑](#footnote-ref-153)
154. TODO REF [↑](#footnote-ref-154)
155. 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. [↑](#footnote-ref-155)
156. Australian Taxation Office, *Decision Impact Statement on Pintarich v Deputy Commission of Taxation [2018] FCAFC 79* (4 April 2019). [↑](#footnote-ref-156)
157. Ibid. [↑](#footnote-ref-157)
158. *Skatteministeriet v Aktieselskabet Forsikrinsselskabet Codan* (C-236/97) [1998] ECR I-8679. [↑](#footnote-ref-158)
159. *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. [↑](#footnote-ref-159)
160. *Commonwealth of Australia Constitution* s 71. [↑](#footnote-ref-160)
161. Directorate-General for Communication (n 82). [↑](#footnote-ref-161)
162. *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. [↑](#footnote-ref-162)
163. 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>. [↑](#footnote-ref-163)
164. TODO REF [↑](#footnote-ref-164)
165. TODO [↑](#footnote-ref-165)
166. TODO Delegated legislation? [↑](#footnote-ref-166)
167. TODO flesh out? [↑](#footnote-ref-167)
168. Solan (n 132) 287. [↑](#footnote-ref-168)
169. TODO Case 29/69, Erich Stauder v City of Ulm, 1969 E.C.R. 419. [↑](#footnote-ref-169)
170. Ibid 3-7. [↑](#footnote-ref-170)
171. Solan (n 132) 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. [↑](#footnote-ref-171)
172. 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 regimes des langues 1984* [Languages Regulation Act 1984] (Luxembourg) art 2. [↑](#footnote-ref-172)
173. TODO REF/FLESHING OUT NEEDED [↑](#footnote-ref-173)
174. See Lisa Crawford et al, *Public Law and Statutory Interpretation: Principles and Practice* (Federation Press, 2017) 228–256 (‘*Public Law and Statutory Interpretation*’). [↑](#footnote-ref-174)
175. (1998) 194 CLR 355. [↑](#footnote-ref-175)
176. TODO Crawford: *Gillick v West Norfolk and Wisbech Area Health Authority* [1986] 1 AC 112 [↑](#footnote-ref-176)
177. (2020) 380 ALR 262. [↑](#footnote-ref-177)
178. TODO [↑](#footnote-ref-178)
179. of Part 3-2 of the *National Consumer Credit Protection Act 2009* (Cth). [↑](#footnote-ref-179)