Technology and Regulation

The theory of 'Regulation By Design': towards a pragmatist reconstruction

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Abstract

Two notable trends emerge in the theoretical treatment of regulation by design (RBD). Essentialists treat RBD as the product of policy enactments on the part of public bodies (i.e., 'rules for design'). Functionalists cast regulation as an overarching practice that subsumes design, which they relegate to the status of a mere instrument (i.e., 'ruling by design'). The essentialist view neglects the complexity of regulatory environments, while the functionalist one neglects the complexity of regulatory practices. This article reconceptualises the relationship between design and regulation so as to account for the multifaceted nature of the latter without neglecting the autonomy of the former. Diverging from both the essentialist view of regulation as a set of *rules* and the functionalist view of regulation as a *practice*, the article advances a pragmatist view of regulation as a rule-making *activity*, that is, *regulativity*, which is performed through social practices like design (i.e., 'rule of design'). Thus, RBD is redefined as the regulative activity of design.

1. Introduction

The design of things is more than a sketch. Once materialised, design shapes the experiences of individuals and communities in a shared environment. Such a functional, as opposed to a purely aesthetical, conception of design has sparked debates across various disciplines. Architecture and urban studies, for instance, remind us that the design of gated communities serves the purpose of deterring trespassers, whereas designs like Pocket neighbourhoods aim to form a stark sense of community.[1] Philosophers surmised that

1 John Zeisel, Sociology and Architectural Design (Rusell Sage Foundation 1975). <https://muse.jhu.edu/pub/207/monograph/book/60742> accessed 15 November 2023.

design is a practice that transforms nature into culture,[2] or explored how it can empower user experience.[3] Sociologists, along with political scientists, have explored design's political and societal implications, revealing, for instance, that the same design may have opposing effects on different communities.[4]

The functional value of design gained increasing relevance in regulatory governance theory, leading to what is generally referred to as 'Regulation By Design' (RBD),[5] which may be defined as a research field that explores, develops, and criticises the regulative function of design. RBD's potential has gained increasing relevance in technology regulation discussions[6] and has become a feature of EU law – informing the GDPR and the AI Act.[7]

This article focuses on the theoretical treatment of RBD and the conceptual interplay between design and regulation. A theoretical approach to this topic may seem superfluous at first; RBD has a practical nature. However, as we shall see, the theoretical treatment of the relation between design and regulation plays a significant role in operationalising RBD and addressing the challenges that derive from this practice.

The relationship in question has been subject to two approaches. First, the relation between regulation and design has been interpreted from an *essentialist* perspective. On that interpretation, regulation is contained within the framework of public institutions. The design-regulation nexus has also been examined from a *functionalist* standpoint. In that case, regulation is elevated to the ontological status of a practice, and design serves as one of several tools by which regulation is actuated.

To essentialists, regulation is a set of rules that are enacted and enforced by state institutions.[8] Accordingly, RBD refers mainly to design requirements that feature in legal norms (i.e., 'rules for design'). Conversely, a functionalist would claim that the concept of regulation can be equated to its functions of influencing behaviour, setting standards, and gathering information.[9] The functionalist converts regulation from a set of *rules* into a *practice* - the premise of the theory is that regulators are supplied with a toolbox that enables them to practise regulation. Their tools are shaped as hierarchical control (e.g., law), community-based control (e.g., community norms), competition-based control (e.g., markets), and design-based control (e.g., code).[10] Consequently, functionalists view RBD as 'ruling by design'.

The essentialist view limits the scope of regulation to the work of public institutions; it tends to neglect the interplay and the interdependency between public institutions and assorted social actors.[11] By concentrating exclusively on the regulative power of the state, the essentialist neglects the regulative potential of non-state

2 Vilém Flusser, Shape of Things: A Philosophy of Design (Reaktion Books 2013).
3 Don Norman, *Design of Everyday Things* (Hachette Book Group USA 2013).
4 Langdon Winner, 'Do Artifacts Have Politics?', Computer Ethics (Routledge 2007).
5 Kostina Prifti and others, 'Regulation by Design: Features, Practices, Limitations, and Governance Implications' (2024) 34 Minds and Machines 13; Karen Yeung, 'Towards an Understanding of Regulation by Design' in Roger Brownsword and Karen Yeung (eds), Regulating Technologies: Legal Futures, Regulatory Frames and Technological Fixes (Hart Publishing 2008) 79-108.
6 Ronald Leenes, 'Framing Techno-Regulation: An Exploration of State and Non-State Regulation by Technology' (2011) 5 Legisprudence 143; Roger Brownsword, 'Technological Management and the Rule of Law' (2016) 8 Law, Innovation and Technology 100; Karen Yeung, '"Hypernudge": Big Data as a Mode of Regulation by Design' (2016) Information, Communication & Society 19(1) 1-19, TLI Think; Aurelia Tamo-Larrieux, Simon Mayer and Zaira Zihlmann, 'Not Hardcoding but Softcoding Privacy' (2018) <https://www.alexandria.unisg.ch/handle/20.500.14171/110418> accessed 18 October 2023.
7 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 (General Data Protection Regulation) art 25; Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) COM (2021) 206 final, ch 2.
8 Robert Baldwin and others (eds), A Reader on Regulation (Oxford University Press 1998); Christopher Hood, The Tools of Government (Macmillan 1983).
9 Julia Black, 'Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a "Post-Regulatory" World' (2001) 54 Current Legal Problems 103; Andrew Murray and Colin Scott, 'Controlling the New Media: Hybrid Responses to New Forms of Power' (2002) 65 The Modern Law Review 491.
10 Murray and Scott (n9); Lawrence Lessig, 'The New Chicago School' (1998) 27 The Journal of Legal Studies 661.
11 Colin Scott, 'Analysing Regulatory Space: Fragmented Resources and Institutional Design' [2001] Public Law 329; Leigh Hancher and Michael Moran, Capitalism, Culture, and Economic Regulation (Clarendon Press 1989).

actors who may further or thwart the ends of state-centred regulation.[12] The essentialist is therefore liable to overlook the complex realities of regulatory contexts.

Functionalism has been advanced as an antidote to this problem, enabling a transition from an atomistic to a systemic treatment of regulation.[13] The focus moves from the state to assorted social actors and from rules to various mechanisms. These adjustments, however, cause the functionalists to commit the errors that they purport to correct – the complex realities of practices, like design, are neglected, and the practices in question are perceived as neutral tools that regulators can wield as they see fit.[14] Consequently, as far as the relationship between regulation and design is concerned, the functionalist overlooks the autonomy of design and reduces it to a mere instrument of regulation.

Essentialists neglect the complexity of regulatory environments, while functionalists neglect the complexity of regulatory practices. Introducing lessons from design theory and pragmatist philosophy, this article proposes an alternative approach that entails reconceptualising the relationship between design and regulation by acknowledging the multifaceted nature of the latter without sacrificing the autonomy of the former. This work re-ontologises regulation by relying on a pragmatist conception of design as a social practice. Diverging from both the essentialist view of regulation as a set of *rules* and from the functionalist view of regulation as a *practice*, the article advances a pragmatist view of regulation as a rule-making *activity*, that is, regulativity. Regulation is subsumed into the practice of design, and it is equated to design's rule-making activity (i.e., 'rule of design'); if understood thus, regulation can be performed through social practices other than design, such as law (e.g., 'rule of law'). In this way, the multifaceted nature of regulation is recognised without the autonomy of design being downplayed.

The foregoing conclusion emerges from an exposition that is structured as follows. The problem statement is clarified in the introductory section. Section II presents the research field of RBD, its emergence and development. Then, the paper focuses on the concepts of regulation and design individually. Section III elaborates on the intricacies of contemporary theories of regulation. The analysis reveals that the treatment of regulation has shifted from an essentialist, deontic paradigm to a functionalist, dialectic one. Section IV focuses on exploring the concept and the theory of design based on design's function, nature, and logic. Having explored both regulation and design theoretically, section V turns to pragmatist epistemology for guidance in grasping the relation between regulation and design, in order to semanticise RBD. The section examines two epistemological developments, namely the shift from foundationalist and universalist to contextual and situated knowledge, as well as the shift from passive to (inter)active knowledge. These epistemological distinctions are applied to the concept of design, which is viewed pragmatically as a social practice that is contextual and interactive. Building on this understanding, Section VI recasts the meaning of RBD as follows: regulation is the rule-making activity of design; it is the process through which design converts chance into order. Other practices also perform such rule-making activities. Regulation can therefore be defined as the rule-making activity of social practices. In consequence, it transpires that regulation is neither a set of rules nor a practice but an *activity* that is performed through social practices like design.

12 P.N. Grabosky, 'Counterproductive Regulation' (1995) 23(4) International Journal of the Sociology of Law 347.

13 Julia Black, 'Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a "Post-Regulatory" World' (2001) 54 Current Legal Problems 103; Ian Ayres and John Braithwaite, Responsive Regulation: Transcending the Deregulation Debate (Oxford University Press 1992); Gunther Teubner, 'The Transformation of Law in the Welfare State' in Gunther Teubner (ed), Dilemmas of Law in the Welfare State (de Gruyter 1986).

14 Serge Gutwirth, Paul De Hert and Laurent Sutter, 'The Trouble with Technology Regulation: Why Lessig's "Optimal Mix" Will Not Work' in Roger Brownsword and Karen Yeung (eds), Regulating Technologies: Legal Futures, Regulatory Frames and Technological Fixes (Hart Publishing 2008); Dimity K. Smith, 'What Is Regulation-A Reply to Julia Black' (2002) 27 Australian Journal of Legal Philosophy 37.

2. The emergence and development of RBD

Consider a law that prohibits the entry of unauthorised personnel into a marked area. This situation would comprise 'regulation by law'. Consider, then, that this marked area is surrounded by barbed wires that are loaded with electricity. In this case, the design of the area plays a regulative role (i.e., there is RBD) that enables and facilitates the aim of regulation by law, which was to prevent the entry of unauthorised personnel. Reidenberg articulated clearly the observation that the regulative activity of design can support the regulative functions of the law.[15] Lessig developed the point further. Speaking of code and architecture, Lessig conjoined design as a distinct regulatory modality alongside law, markets, and community norms.[16]

Later, Murray and Scott assembled these various forms of regulation in a structured framework comprised of four *categories* of control, which include hierarchical control (e.g., law), community-based control (e.g., community norms), competition-based control (e.g., markets), and design-based control (e.g., code), as well as three *forms* of control, which are standard setting, information gathering, and behaviour modification.[17] These regulative modalities do not operate independently but rather interrelatedly, which means they can be applied jointly and impact one another, both positively and negatively.[18]

These developments were focused on the state as the main actor behind RBD. Later, scholars have broadened the scope of RBD to include the actions and influence of *non-state actors*.[19] The interactions between design and regulation were mapped in four different types, namely 1. *Law regulating code,* where the law sets standards and requirements with regards to how products should be designed; 2. *Code regulating human behaviour,* where design influences the behaviour of individuals by outlining what is possible; 3. *Law regulating the effects of robotic behaviour* is where the law deals with the outcome of our interactions with robots and AI; 4. *Code regulating robotic behaviour* is concerned with how design can be used to influence and control the behaviour of a technological system, such as a robot.[20]

The fourth type of interaction between regulation and design (i.e., code regulating robotic behaviour) reveals a feature that RBD does not share with other regulatory categories. The immediate regulatees of regulation by law, regulation by markets, or regulation by community norms are, typically, the users or the designers of the technology. However, with RBD the immediate regulatee may be the technological system itself, considering the role of design in affecting the behaviour of the technologies.

As existing works had focused on the positive potential of RBD, other scholars started to consider its risks. Brownsword recognised the positive potential of design while advising prudence concerning its threats.[21] RBD may facilitate and support values in society, but it may also be used to suppress them. Through this feature, RBD may tamper with individual agency and force individuals into strict compliance.[22] For example, some have argued in favour of speed restrictions as a form of regulation by design. They claim that vehicles should be designed so that they are not able to exceed a predefined speed.[23] However, such a rigid form of RBD would prove counterproductive in cases of emergency and it would restrict individual agency.

15 Joel R. Reidenberg, 'Lex Informatica: The Formulation of Information Policy Rules through Technology' (1997) 76 Texas Law Review 553.
16 Lawrence Lessig, 'The New Chicago School' (1998) 27 The Journal of Legal Studies 661.; Lawrence Lessig, Code and Other Laws of Cyberspace (Basic Books, Inc 1999).
17 Andrew Murray and Colin Scott, 'Controlling the New Media: Hybrid Responses to New Forms of Power' (2002) 65 The Modern Law Review 491.
18 Ronald Leenes and Federica Lucivero, 'Laws on Robots, Laws by Robots, Laws in Robots: Regulating Robot Behaviour by Design' (2014) 6 Law, Innovation and Technology 193.
19 Ronald Leenes, 'Framing Techno-Regulation: An Exploration of State and Non-State Regulation by Technology' (2011) 5 Legisprudence 143.
20 Ronald Leenes and Federica Lucivero, 'Laws on Robots, Laws by Robots, Laws in Robots: Regulating Robot Behaviour by Design' (2014) 6 Law, Innovation and Technology 193.
21 Roger Brownsword, 'Technological Management and the Rule of Law' (2016) 8 Law, Innovation and Technology 100.
22 ibid.
23 David Zipper, 'You Shouldn't Be Driving over 100 Mph-and Your Car Shouldn't Let You' (Fast Company, 18 November 2023) <https://www.fastcompany.com/90985257/you-shouldnt-be-driving-over-100-mph-and-your-car-shouldnt-let-you> accessed 29 March 2024.

In this regard, the regulative nature and potential of design is markedly distinct from that of law, social norms, or markets. Design can simply disable the possibility of non-compliance.[24] As Lessig wrote: "*One obeys these laws as code not because one should; one obeys these laws as code because one can do nothing else.*"[25] Consequently, design facilitates a shift in regulatory focus from (only) socially mediated regulatory modalities, such as law, markets, and social norms, to *environmentally mediated* modalities, such as design.[26]

This distinct regulatory feature of design bears both positive and negative implications. On the one hand, design can be more effective than other modalities that rely on sanctions and incentives. Conversely, on the negative side, design may reduce individual and group agency by replacing choice (to do the morally right thing) with design (to do what is possible).[27] Limiting choice by increasing RBD is not a default option, but it does manifest particularly with rigid forms of RBD,[28] such as our earlier example with predefined speed restrictions on vehicles. These negative implications magnify in contexts when design serves private interests, which could be legitimate or illegitimate.[29] Furthermore, by tampering with individual agency, design threatens the core of the Rule of Law.[30]

As design evolved into an effective regulatory strategy, the spotlight on its legitimacy concerns grew stronger. These concerns derived, in part, from a tendency influenced by a functionalist conception of RBD according to which law and design are interchangeable tools in the hands of regulators. Lessig's famous dictum 'code is law' represents an approach that promotes the use of code (i.e., design) to attain the regulative objectives of law, such as compliance. However, law is enacted by democratically elected bodies, based on constitutional processes, while design is not. Design is a product of designers, who are typically private actors that pursue private interests. When it is used to advance private interests, RBD threatens to bypass democratic processes and the values of Rule of Law, especially when it is being used to achieve illegitimate regulatory effects.[31]

Such legitimacy concerns have stifled the development and the potential of RBD. Many scholars have argued against RBD on a conceptual level. These concerns, although valid, are not inherent of the concept of RBD, but rather of the functionalist theory of RBD which, as we shall see in the following section, is limited in its abilities to distinguish between degrees of legitimacy of regulatory practices due to the fact that it views regulation itself as an overarching practice. We shall delve deeper into this critique in the next section.

3. Regulation

Efforts to arrive at a substantial understanding of the concept of regulation call for engagement with its numerous shapes and forms. To this end, the exposition in this section focuses on the semantic development of that concept in the regulatory governance literature, analysing the distinctions that have been drawn between its mechanisms, actors, natures, and logics. In the process of tracing this development, it becomes apparent that essentialists treat regulation as rule based, state centred, and governed by deontic logic, whereas the functionalists recast it as decentred and shaped by dialectic logic.

24 Roger Brownsword, 'Code, Control, and Choice: Why East Is East and West Is West' (2005) 25 Legal Studies 1.
25 Lawrence Lessig, 'The Zones of Cyberspace' (1996) 48 Stanford Law Review 1403.
26 Andrew Murray, The Regulation of Cyberspace: Control in the Online Environment (Routledge-Cavendish 2007).
27 Roger Brownsword, 'Code, Control, and Choice: Why East Is East and West Is West' (2005) 25 Legal Studies 1; Roger Brownsword, 'Technological Management and the Rule of Law' (2016) 8 Law, Innovation and Technology 10.
28 Kostina Prifti and others, 'Regulation by Design: Features, Practices, Limitations, and Governance Implications' (2024) 34 Minds and Machines 13.
29 Colin Scott, 'Regulating Everything' <http://hdl.handle.net/10197/1821> accessed 12 June 2024.
30 For instance, RBD can interfere with Rule of Law principles by facilitating decisions with legal implications without the user's awareness. See for more: Brownsword (n 6); Mireille Hildebrandt, Smart Technologies and the End(s) of Law: Novel Entanglements of Law and Technology (Edward Elgar Publishing 2015); U. Pagallo, 'Cracking down on Autonomy: Three Challenges to Design in IT Law' (2012) 14 Ethics And Information Technology 319.
31 Mireille Hildebrandt, 'Legal Protection by Design: Objections and Refutations' (2011) 5 Legisprudence 223.

Semantically, the concept of regulation has developed in three distinct stages. Initially, regulation was thought to be a set of rules that the state enacts and enforces through the government, the legislature, and the judiciary.[32] Interpreted thus, regulation is authoritative and based on rules (in terms of mechanisms) and enforced by state institutions (in terms of actors). In the second stage of the development of the concept, regulation was conceptualised by reference to the diverse mechanisms that the state employs to manage various aspects of society, including the economy. This meaning of regulation includes not only authoritative rule-based regulation but also other levers that the state may pull. Hood posited that governments regulate by using four tools, namely nodality, authority, treasure, and organisation.[33] Through his theory, Hood aims to show that governments and, more broadly, states use mechanisms that are more diverse than targeted rules in order to achieve their regulatory goals.

These two early approaches differ on the issue of mechanisms but share common ground on the issue of actors. Both can be characterised as essentialist.[34] Irrespective of whether regulation is taken to be a combination of targeted rules or a larger set of mechanisms, the assumption is that the regulator is the state and the regulatees are the members of society. The essentialist view of regulation was subjected to heavy criticism. The propositions that the state can act as commander and controller effectively and single-handedly and that there is a linear path from rulemaking to implementation were seen as theoretically reductive and as practically impotent.[35] First, the essentialist conceptualisation of regulation was thought to cause regulatory failure because knowledge and the exercise of power are fragmented and cannot be accessible to a single social agent, even if that social agent is the state.[36] Second, the essentialist view neglects the regulative potential of non-state actors who may further or thwart the ends of state-centred regulation.[37] Third, unilateral, top-down, and state-centred regulation was thought incapable of accounting for the interdependencies between regulator and regulator.[38] In that sense, the essentialist conceptualisation of regulation was premised on the assumption that the dynamics between the public, that is, the state, and the private, that is, individuals and groups in society, are not interactive.[39]

The critique of state-centred regulation led to the emergence of the functionalist view of regulation. Conceptually, functionalists decentred regulation. This decentring entailed a shift in actors and mechanisms. First, assorted social actors joined the state and the government as regulators. Second, there was a shift in mechanisms, from rules to various techniques of social control that extend beyond Hood's tools of government. Last, the hitherto atomistic view of regulation became systemic, and regulation came to be referred as a 'regime'[40] or as a 'space'.[41]

The founding pillars of functionalism were recognising that knowledge and power are fragmented, that regulators and regulatees interact and depend on each other, and that the public and the private spheres are not mutually exclusive.[42] As a result, the functionalist view accounts for a variety of social mechanisms, and the functionalists recognise that the production of those mechanisms is not a state monopoly.[43]

32 Baldwin and others (n 8).
33 Christopher C Hood, 'A Changing Mix of Government Tools?' Christopher C Hood (ed), The Tools of Government (Macmillan Education UK 1983) <https://doi.org/10.1007/978-1-349-17169-9_9> accessed 17 November 2023.
34 David Levi-Faur, 'Regulation and Regulatory Governance' (2011) 1 Handbook on the Politics of Regulation 1.
35 Doreen Mcbarnet and Christopher J Whelan, 'Creative Compliance and the Defeat of Legal Control: The Magic of the Orphan Subsidiary' in Keith Hawkins (ed), The Human Face Of Law: Essays in Honour of Donald Harris (Oxford University Press 1997) <https://doi.org/10.1093/oso/9780198262473.003.0009> accessed 17 November 2023; Black (n 9).
36 Scott (n 11).
37 Grabosky (n 12).
38 Hancher and Moran (n 11).
39 RAW Rhodes, Understanding Governance: Policy Networks, Governance, Reflexivity and Accountability (Open University 1997) <https://eprints.soton.ac.uk/336524/> accessed 17 November 2023.
40 Ayres and Braithwaite (n 13); Daniel W Drezner, 'All Politics Is Global: Explaining International Regulatory Regimes', All Politics Is Global (Princeton University Press 2008) <https://www.degruyter.com/document/doi/10.1515/9781400828630/html> accessed 17 November 2023.
41 Hancher and Moran (n 11).
42 Black (n 9).
43 See, for example, Ostrom, Posner, and Lessig, who focused on different mechanisms, respectively community norms, markets, and code/design; Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action (Cambridge University Press 1990); Richard A. Posner, 'Social Norms and the Law: An Economic Approach' (1997) 87 The American Economic Review 365; Lessig, 'The New Chicago School' (n 10).

These developments imply changes in the understanding of the nature and logic of regulation. State-centred regulation is ontologically essentialist – it has specific elements (i.e., concrete mechanisms and actors) without which it cannot exist. Furthermore, essentialist regulation relies on deontic logic, which concerns the logical relevance of concepts such as obligation, permissibility, agency, and such like. Those concepts outline the conditions of possibility within regulatory systems.[44] Simply put, the essentialists saw regulation as what the state does when it enacts and enforces rules that outline what is permissible and obligatory in a regulatory environment.

The conceptual shift to decentralised mechanisms and actors enabled the ontological transition from essentialism to functionalism. Since it was no longer possible to pin regulation down to specific mechanisms and actors, it could no longer be defined by reference to a list of essential elements. Instead, it was defined in functional terms: regulation is what regulation does, that is, setting standards, gathering information, and influencing behaviour.[45] The focus also shifted from deontic to dialectic logic. Relying on proceduralization and discursive reasoning, the functionalists cast regulation as being in the service of social interaction. Dialectic logic, when applied to the regulation of a system, is intended to maintain stability by resolving tensions. To regulate is to alter the conditions that keep the system stable and continuous in order to reduce friction. As Black put it, "*[Regulation] should be a process of coordinating, steering, influencing, and balancing interactions between actors/systems, and of creating new patterns of interaction which enable social actors/systems to organise themselves, using such techniques as proceduralization, collibration, feedback loops, redundancy, and above all, countering variety with variety*".[46] As a result, functionalists transitioned regulation conceptually by redefining it as a practice performed by both public and private actors.

Functionalism overcame some of the shortcomings of essentialism. By expanding the concept of regulation, the functionalists accounted for more regulative activity than the essentialists. However, this expansion carried the risk of a 'flat ontology' in which everything is regulation. As Black writes: "*Regulation of the family, health, reproduction, contracts, unemployment, government itself: everything, it seems, is subject to regulation. What had simply been seen as 'law' before is now regulation: company law is redesignated as 'regulation'; contract law is 'regulation'*".[47]

This flat ontology of regulation makes it difficult to distinguish between degrees of legitimacy and does not account for the relationship between regulation and governance.[48] For example, in functionalist literature there are no formal hierarchies between regulative practices, except for how well they perform their regulative effect. RBD is treated similarly to regulation by law and regulation by markets. This functionalist approach is contingent on a view of regulation as an overarching practice, which complicates the analysis of the concept and its regulatory practices.

As a result, the ontological elevation of regulation to the status of a practice comes at the cost of the ontological reduction of design, as well as of other practices, from practices to tools. However, design is a practice in its own right. So are the law, markets, and community practices. A return to essentialism would be undesirable, for the reasons that were set out above; efforts should instead be directed at protecting the multifaceted and diverse nature of regulation without adhering to a flat ontology and without reducing practices like design to mere tools of regulation. The following sections attempt to address this conceptual conflict by focusing on design literature and pragmatist philosophy. Let us begin the path of reconceptualisation by examining design.

44 Luciano Floridi, 'The Logic of Design as a Conceptual Logic of Information' (2017) 27 Minds and Machines 495.
45 Murray and Scott (n 9).
46 Black (n 9).
47 Black (n 9) 132.
48 Gutwirth, De Hert and Sutter (n 14).

4. Design

Design, not unlike regulation, is a multifaceted concept. Grasping the concept fully requires an in-depth exploration and analysis of its intricacies that derive from competing theories. This section provides an analytical account of the different perspectives on design, based on existing theories. To structure these differences, they are discussed by analytically distinguishing among the functions, the natures, and the logics of design, as discussed and advanced in the design literature.

4.1 The function of Design

The variety of design functions in literature may be categorised in two types, depending on whether they see *design as formation or as thinking*. Design as formation views *form* as the ultimate object of design.[49] It is central to disciplines like architecture, urban planning, and product design.[50] Viewed as formation, designing means *informing matter into shape*.[51] Design as formation commits to a strict distinction between form and matter, which, as we shall see, is challenged by pragmatist epistemology.

The second type of function of design may be referred to as design *thinking*, a growing research field that is concerned with design as knowledge processes. Initially, Simon advanced an understanding of design as knowledge processes that serve conceptual problem-solving functions.[52] The first appearance of the term was in Rowe, who proposed using conceptual elements of design processes and extrapolating them to other disciplines, in order to develop some form of general principles of design thinking.[53] Design thinking is developed further with the introduction of concepts like framing,[54] analyses of the type of problems that designers deal with, such as wicked or ill-defined problems,[55] and the type of reasoning used in design thinking.[56] Design thinking expanded also in the context of innovation, referring to how organisations can use design thinking to solve organisational issues and stimulate innovation.[57] Lately, design thinking is applied also to philosophy, which is viewed as conceptual engineering.[58]

4.2 The nature of Design

Existing theories of design perceive the nature of designing in three ways: as an activity, as a profession, or as a practice. An example of design as an *activity* is present in the work of Brown.[59] Adopting an organisational science perspective, design as an activity refers to solving problems creatively and thinking like a designer. In its function, it approaches designing as thinking, as a creative problem-solving activity. Thus, designing as an activity offers a somewhat 'simple' view of designing as thinking, which may be performed by anyone that wishes to solve problems creatively and innovate in their daily practice.

On the opposite end of design ontology is the view of design as a *profession*, occupation, or discipline, most clearly found in the work of Buchanan.[60] Professional designers apply specialised knowledge, skills, and methods to solve problems and generate new solutions. Designing as a profession is focused on formation, but the methods that professional designers use are a strong component, which means designing as thinking is included. Design as a profession implies that only those who work as designers, engage with the theory and practice of design substantially – in other words: those that design for a living – can be called designers. This view implies that not every problem-solving function requires designing; design is a profession that

49 Christopher Alexander, Notes on the Synthesis of Form (Harvard University Press 1964) 15.
50 N.F.M. Roozenburg and J. Eekels, Product Design: Fundamentals and Methods (Wiley 1995); Richard Morris, The Fundamentals of Product Design (Bloomsbury Publishing 2016).
51 Flusser (n 2).
52 Herbert A. Simon, The Sciences of the Artificial (3rd edn, MIT Press 1996).
53 Peter G. Rowe, Design Thinking (MIT Press 1991).
54 Donald A. Schön, The Reflective Practitioner: How Professionals Think in Action (Routledge 2017).
55 Richard Buchanan, 'Wicked Problems in Design Thinking' (1992) 8 Design Issues 5; Nigel Cross (ed), 'Designerly Ways of Knowing', Designerly Ways of Knowing (Springer 2006) <https://doi.org/10.1007/1-84628-301-9_1> accessed 17 November 2023.
56 Kees Dorst, 'The Core of "Design Thinking" and Its Application' (2011) 32 Design Studies 521.
57 Tim Brown, 'Design Thinking' (2008) 86 Harvard Business Review 84.
58 Luciano Floridi, The Philosophy of Information (OUP Oxford 2011).
59 Brown (n 57).
60 Buchanan (n 55).

deals only with *wicked problems*, which are those problems that are characterised by complexity, uncertainty, and various social and ethical implications.[61]

Design as a *practice* differs from both design as an activity and as a profession, while preserving parts of those ideas. Differently from an activity and similarly to a profession, design as a practice assumes that there are knowledge processes, skills, methods, and traditions in design with which an individual must substantially engage in order to practise design. It is not sufficient to think like a designer to practise design. However, design as a practice does not limit the practice of design to professional designers. Instead, any individual may practise designing, provided they engage with the processes, skills, methods, and traditions of design as a practice.[62] Jones and Kimbell approach design in this manner, which connects to both designing as formation and as thinking.[63] The practice-based approach to design tends to view design as embedded in cultural, social and contextual realities. Contextuality is, thus, an important feature of design as a practice in line with pragmatist epistemology. To properly understand this distinction, the third category of the concept of design is relevant, that is the logic of design.

4.3 The logic of Design

Design methods may rely on *a priori* or contextual logic. They apply to both functions of design (formation and thinking) and the three categories of the nature of design (activity, profession, practice).

The *a priori logic* of designing is based on pre-established principles, rules, and frameworks that are assumed to be universal, univocal, and independent of any specific context. This logic of design is foundationalist, in that it claims that there are foundational principles or rules that must be designed universally into any system. From the world of design, principled-based approaches are explored, where design scholars advance principles like usability, simplicity, and timelessness in design.[64]

A *contextual logic* of design, on the other hand, is based on the significance of specific contexts, environments, and circumstances that encircle the problem which design aims to solve. For a contextual logic of design, there are no truly universal rules as each design solution must be embedded in and take into account cultural, social, and environmental elements. The contextual logic of designing seems to be prevalent in the literature on design. It is found more prominently in the works of Lawson,[65] Dorst,[66] and Kimbell.[67]

4.4 Design as a Multifaceted Concept

The previous exposition of the concept and theory of design, based on its function, nature, and logic, is summarised in Table 5-1. By focusing on these three features, the section constructs an analytical understanding of design as a multifaceted concept.

61 Buchanan (n 55); Horst W.J. Rittel and Melvin M .Webber, 'Dilemmas in a General Theory of Planning' (1973) 4 Policy Sciences 155.

62 From a practical point of view, many works exist on the type of methods and knowledge processes involved in design as a practice. For instance, see Annemiek van Boeijen and others, Delft Design Guide: Design Strategies and Methods (2014).

63 John Chris Jones, Design Methods (John Wiley & Sons 1992); Lucy Kimbell, 'Rethinking Design Thinking: Part I' (2011) 3 Design and Culture 285.

64 Klaus Klemp, Jorrit Maan, Erik Mattie and Dieter Rams: Ten Principles for Good Design (Cees W De Jong ed, Prestel 2017); William Lidwell, Kritina Holden and Jill Butler, Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach Through Design (Rockport Publishers 2010).

65 Bryan Lawson, How Designers Think: The Design Process Demystified (Routledge 2006).

66 Dorst (n 56).

67 Kimbell (n 63).

Table 5-1. Design as a concept

Features	Types		
Function	Formation[68] Thinking[69]		
Nature	Profession[70]	Practice[71]	Activity[72]
Logic	A priori[73] Contextual[74]		

This understanding ought to be viewed as instructive. In its instructive nature, this view may help one understand what design can be but not what design *is*. It is necessary to commit to a specific version of what design is, comprising the specific types for each feature. We will navigate through this commitment exercise by embracing pragmatism as our guiding compass.

5. Pragmatism

The previous sections analyse two multifaceted concepts, namely regulation and design. Understanding RBD entails not only clarifying the relation between these two concepts but necessitates firstly a commitment to a particular understanding of each concept. One may, for instance, commit to an essentialist version of regulation and a view of design as formation. RBD, in this case, would refer to state-based rules about how a physical artefact must be designed. Other combinations would lead to different conceptualisations, which indicates the importance of this theoretical exercise. In this section, we will turn to pragmatist epistemology for help in grounding the concepts of design and regulation, as well as their relation.

The choice to focus on pragmatist epistemology is an intentional one, and this section hopes to demonstrate that it can be a fruitful way to approach design and, consequently, RBD. Central to this choice is pragmatism's capacity to elucidate the nuanced interplay between design practices and regulatory frameworks. There is a clear link between pragmatism and design studies in the literature.[75]

The analysis sheds light on three matters concerning design. In terms of function, it rejects the foundationalist mind-matter dichotomy that generates the distinction between design as formation and design as thinking. In terms of nature, it approaches design as a practice that performs changes in the world. In terms of logic, it views design as a contextual instead of as an *a priori* exercise. These clarifications are advanced by examining two epistemological developments connected with the pragmatist tradition. The first denotes the shift from a foundationalist to a contextual and situated account of knowledge. The second represents the shift from a passive to an (inter)active knowledge.

5.1 From Foundationalism to Contextuality

Some claim that knowledge is derived from innate ideas and rationality; others assert that it is derived from sensed experience. The former view is rationalist; the latter is empiricist. Although they are dichotomous, rationalism and empiricism have the assumption of epistemological dualism in common, that is, both are

68 Alexander (n 49).
69 Simon (n 52); Rowe (n 53); Dorst (n 56).
70 Buchanan (n 55).
71 Jones (n 63); Kimbell (n 63).
72 Brown (n 57).
73 Klemp, Maan and Mattie (n 64); Lidwell, Holden and Butler (n 64).
74 Lawson (n 65); Dorst (n 56); Kimbell (n 63).
75 Peter Dalsgaard, 'Pragmatism and Design Thinking' (2014) 8 International Journal of Design <https://ijdesign.org/index.php/IJDesign/article/view/1087/606> accessed 8 May 2024.

premised on the proposition that mind and matter are metaphysically distinct.[76] Mind-matter dualism is a ground for foundationalism, the claim that one can have a justified belief about some fundamental or zero-level knowledge on which all other knowledge is based. Although the rationalists claim that knowledge comes from within and the empiricists believe that it comes from without, the two schools agree on the existence of fundamental or zero-level knowledge. In the rationalist tradition, foundationalism was largely developed by Descartes.[77] He argued that radical doubt about one's irrational thoughts would leave one with rational thoughts only. Those thoughts are the foundations of one's knowledge. Foundationalism is also prominent in the empiricist tradition, as is evident from the works of Hume and Locke.[78]

The rejection of the foundationalist thesis and mind-matter dualism is one of the contributions of pragmatism to epistemology. Influenced by contemporaneous scientific discoveries such as Darwin's theory of evolution, pragmatists based their epistemology on the premise that the mind is a set of evolved powers that have a basis in biology and that it forms part of the environment rather than being distinct from it. Accordingly, they saw ideas as instruments for coping with the environment.[79] Peirce rejected foundationalism by claiming that there cannot be any zero-level knowledge. According to him, all knowledge is preceded by inquiry, and inquiry is based on existing habits and situations. The focus is thus not on foundational knowledge but on inquiry. Knowledge is formed in the course of a continuous biological and cognitive interaction between the individual and the environment.[80] Dewey developed this central pragmatist idea to explain how and when an individual becomes inclined to change their habits. He thought that when the individual's ideas and beliefs are insufficient to meet the demands of the environment, the individual begins to inquire, that is, to apply their intelligence consciously to situations.[81] As a result, knowledge, according to pragmatist epistemology, is *practical* in two ways, one contextual, that is, embodied in practices, and the other instrumental in the Darwinian sense.[82] This dual view of knowledge in pragmatist epistemology is important for distinguishing between pragmatism, rationalism, and some strands of empiricism. It is also crucial for understanding the role that practical knowledge plays in the environment, which follows in the next section.

5.2 From passive to (Inter)active Knowledge

Austin observed the phenomenon of 'performativity' in language, which does not only describe the world but can, in part, create it.[83] Speech acts, such as "I now declare you husband and husband", are such an example. This speech act performs the act of marrying and constitutes the marriage of the newlyweds. Austin's notion of performativity was developed by social constructivists and critical theorists, such as the highly influential Butler, who showed that language and habits have a performative and prescriptive effect on the concepts of sex and gender.[84]

Performativity is an epistemological development because it allocates an active function to knowledge. Since Plato, knowledge has been thought to be descriptive and functionally passive; in other words, the knower perceives and apprehends knowledge that is already created.[85] The concept of performativity implies that when humans interact with the world, they do not only describe the world but also create

76 John Dewey, 'Duality and Dualism' (1917) 14 The Journal of Philosophy, Psychology and Scientific Methods 491.
77 René Descartes, 'Meditations on First Philosophy', Seven Masterpieces of Philosophy (Routledge 2008).
78 Joseph Margolis, 'Skepticism, Foundationalism, and Pragmatism' (1977) 14 American Philosophical Quarterly 119; Peter Markie and M Folescu, 'Rationalism vs. Empiricism' in Edward N Zalta and Uri Nodelman (eds), The Stanford Encyclopedia of Philosophy (Spring 2023, Metaphysics Research Lab, Stanford University 2023) <https://plato.stanford.edu/archives/spr2023/entries/rationalism-empiricism/> accessed 17 November 2023.
79 Charles Sanders Peirce, 'The Fixation of Belief', The Fixation of Belief (Princeton University Press 2021) <https://www.degruyter.com/document/doi/10.1515/9781400831296-007/html> accessed 17 November 2023; Charles S Peirce, Philosophical Writings of Peirce (Courier Corporation 1955).
80 Charles Sanders Peirce, 'The Fixation of Belief', The Fixation of Belief (Princeton University Press 2021) <https://www.degruyter.com/document/doi/10.1515/9781400831296-007/html> accessed 17 November 2023;
81 J. Dewey, Logic: The Theory of Inquiry (Holt 1938).
82 Thomas C. Grey, 'Holmes and Legal Pragmatism' (1988) 41 Stanford Law Review 787.
83 John Langshaw Austin, How to Do Things with Words (Clarendon Press 1975).
84 Judith Butler, 'Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory' (1988) 40 Theatre Journal 519.
85 Luciano Floridi, 'A Defence of Constructionism: Philosophy as Conceptual Engineering' (2011) 42 Metaphilosophy 282.

it. Epistemologically, there are two approaches to the active account of knowledge. The critical approach explains how existing knowledge is constructed. The constructionist approach, conversely, is forward looking – it explains how new knowledge can be created.

The social constructivists developed the critical approach by drawing on pragmatist epistemology.[86] They posit that knowledge is constructed on the basis of cultural, historical, and contextual factors. Meaning and understanding are co-constructed within social groups. Post-structuralists tend to agree with these propositions. They also tend to add that knowledge is neither fixed nor objective – it is shaped by power dynamics and social relations that are embedded in language and discourse.[87] Knowledge, for post-structuralists, is not representative of any external reality but a manifestation of discursive practices and systems of power. Therefore, the critical approach is also anti-realist.[88]

Constructionists commit to a realist understanding of knowledge as being practically useful for coping with reality. The constructionist is concerned with the means of creating new, improved knowledge for practical purposes, and with the role that knowledge performs in the environment.[89] Knowledge, understood in this way, is both active and interactive, as the process takes place in the interaction between the knowing subject and the environment. Constructionism posits that language and other practices have a performative role because they inscribe the world, as opposed to describing or prescribing it. This inscription of the world can take the form of re-ontologisation (changes to the nature of the world) and of re-epistemologisation (changes in the way in which individuals come to know the nature of the world).[90] Thus, a constructionist conceptualisation of the performativity of social practices would assert that those practices perform their instrumental roles in society by inscribing the world. This conceptualisation is closely connected to the pragmatist tradition that serves as the foundation of the analysis which is developed in the present chapter.

Epistemological developments that allocate an active, performative function to knowledge and knowledge processes enabled the extension of the concept of performativity to include the actions of design and technological artefacts. Actor-Network Theory (ANT) redefines the role of technologies as active participants, or 'actants', within a network of human and non-human agents.[91] This perspective posits that technologies influence social dynamics and behaviours, contributing to the construction and transformation of society. By recognising the agency and performativity of technological designs, as non-human entities, ANT challenges the traditional dichotomy between society and technology, suggesting that both are intertwined in a continuous process of mutual shaping. This view highlights how technologies can mediate, modify, and even redefine human actions and social relations, thereby becoming integral actors in the social fabric.[92] This performative, mediating effect of technological designs can be understood as 'technology's in-betweenness', referring to the performative role of technological design being embedded in relations between human users, nature, and other technologies.[93]

These reflections on the nature of knowledge and the performativity of technology in the environment provide the necessary foundation for an understanding of RBD and the relation between technology and regulation. This work is provided in the following section.

86 Butler (n 84).
87 Michel Foucault, Archaeology of Knowledge (2nd edn, Routledge 2002); Mitchell M Dean, Governmentality: Power and Rule in Modern Society (2nd edn, SAGE Publications 2010).
88 The argument is developed in: Michael Dummett, The Logical Basis of Metaphysics (Harvard University Press 1991). Antirealist approaches include a variety of epistemological and ontological theories that refute the existence of objective forms of reality.
89 Luciano Floridi, 'A Defence of Constructionism: Philosophy as Conceptual Engineering' (2011) 42 Metaphilosophy 282.
90 Luciano Floridi, 'Technology's in-Betweenness' (2013) 26 Philosophy & Technology 111.
91 Bruno Latour, Reassembling the Social: An Introduction to Actor-Network-Theory (OUP Oxford 2007).
92 Peter-Paul Verbeek, 'Acting Artifacts' in Peter-Paul Verbeek and Adriaan Slob (eds), User Behavior and Technology Development: Shaping Sustainable Relations Between Consumers and Technol (Springer Netherlands 2006) <https://doi.org/10.1007/978-1-4020-5196-8_6> accessed 13 June 2024.
93 Luciano Floridi, 'Technology's in-Betweenness' (2013) 26 Philosophy & Technology 111.

6. RBD: a pragmatist reconstruction

This epistemological exposition enables a grounded understanding of design, particularly concerning the three features highlighted at the beginning of the previous section, namely function, nature, and logic. As regards its function, by rejecting the mind-matter dualism, pragmatism leads to an understanding of the function of design as both formation and thinking. In terms of nature, design encompasses a practical and interactive essence. It is deeply rooted in the methods and traditions of professional designers, but it is not limited to their exclusive domain. Design can be embraced by individuals who engage with these methods and traditions, and perform, by design, a particular effect on the environment. In terms of logic, pragmatism moves away from foundationalism and universalist types of logics, towards a contextual and situated logic. Uniting these aspects, we can understand design, from a pragmatist perspective, as a contextual and situated practice that serves a practical purpose by performing changes, leaving a mark in the world (i.e., inscribing the world). Besides design, practices like law, markets, art and culture, custom, healthcare, and many other domains inscribe the world and leave a mark on it.

Considering these earlier reflections, regulation may be interpreted as an inscription – social practices perform regulation as they inscribe the world. Phrased differently, the rule-making activity of social practices has a performative effect in the environment. This understanding calls for a re-evaluation of the nature of regulation. Instead of viewing regulation as a set of rules (essentialism) or as a practice (functionalism), regulation may be conceptualised as an *activity* that is performed by social practices. Regulation is what *practices* do.[94]

Such a conceptualisation of the nature of regulation has repercussions for the relationship between regulation and practices such as design, and it represents an inversion of the functionalist view. Design and other practices are not treated as elements of regulation; instead, it is regulation that is dependent on and subsumed into social practices. Regulation, thus understood, is not a freestanding or overarching practice. It does not possess separate mechanisms, processes, or actors – they all belong to the specific practices through which regulation occurs. This reconceptualisation of regulation acknowledges the complexity of regulatory environments. It is not a return to the essentialist view whereby regulation is cast as a set of rigid rules that the state enforces. At the same time, it also does not relegate social practices to the status of mere tools and neutral instruments.

Understanding and defining *RBD as the regulative activity of design* connects with the part of regulatory governance scholarship that explores design as an environmentally mediated modality.[95] In turn, STS scholarship substantiates this aim by theorising that environmental agents (i.e., non-human entities such as technologies) interact with and have a performative effect on society.[96]

This pragmatist view of RBD fits various logics of regulating. First, RBD may be understood by reference to deontic logic. The regulativity of social practices materialises as changes to the conditions that make a regulatory system possible. Second, RBD may be understood on the basis of dialectic logic, whereby the regulativity of social practices manifests as changes to the conditions that make the system stable. RBD may also be guided by constructionist logic.[97] That logic is concerned with the identification of contextual and pragmatic conditions that are sufficient to construct a given (regulatory) system. It differs from deontic logic due to its focus on contextuality. It differs also from dialectic logic because its focus is on construction rather than on stability.

In the light of the foregoing, regulation can be more broadly redefined as the rule-making activity of social practices. This means, however, that there is an assemblage of diverse regulativities that stem from the interaction and admixture of disparate but mutually influential practices. We face another obstacle, namely

94 Therefore, it is different from the functionalist view, which would claim that "Regulation is what regulation does".
95 Murray (n 26); Brownsword (n 24).
96 Latour (n 91); Verbeek (n 92).
97 Luciano Floridi, 'The Logic of Design as a Conceptual Logic of Information' (2017) 27 Minds and Machines 495.

the need to regulate the various sources of regulative activity. This understanding leaves room for the important role of *governance* in the relationship between regulation and design. Governance has featured in the debate about that relationship to some degree; the most common argument is that it can assume the position of regulation.[98] Thus, governance is described in the same terms as regulation, which is not helpful for our purposes. Others have adopted an alternative view of governance as an overarching concept within which regulation, law, and design, among other practices, are subsumed and not delineated.[99] This approach is flawed for the same reasons: it still begs the question as to the difference between regulation and governance. Embracing a pragmatist conception of regulation and RBD provides a viable escape route.

Based on the reconstructed understandings of regulation, design, and RBD, following pragmatist epistemology, the concept of governance can be understood as being relevant to steering, coordinating, and accounting for the regulativity of social practices. The efficacy, efficiency, and alignment of the regulativity of social practices with normative societal goals is always contingent. If the regulativity of a practice diverges from its contextual normative fabric, it becomes necessary to hold the agents who are involved accountable. Governance discharges this function. Therefore, *governance may be understood as a meta-regulative activity; it is what practices do when they regulate how other practices regulate*.

The conceptual scheme that has been constructed thus far serves two purposes. First, it redefines regulation as the rule-making activity of social practices. Second, it redefines the relationship between regulation and design, as well as that between RBD and governance. In order to elucidate this second contribution, it may be desirable to apply the conceptual scheme to a simple example of RBD.

Turnstiles as RBD

If design is viewed as a social practice, RBD can be understood as the regulative activity of design. For instance, the design of turnstiles performs a regulative effect in the environment, in that it inscribes the rule that a ticket is needed to board a train. The same rule-making activity may be performed by law, by design, by community norms, or by various combinations thereof. As a result, the role of governance is important, in that it regulates the manner in which social practices regulate. In the turnstile example, governance may be performed by a law that regulates the manner in which design regulates. For instance, the law may stipulate not only that a ticket is needed to board a train but also that the design of turnstiles must reflect the possibility that emergency situations will arise in which evacuation routes become more important than the requirement to purchase a ticket. As a result, the law performs governance in relation to design – it regulates the manner in which design regulates.

This pragmatist view of regulation may seem similar to the functionalist view. Both differ from the essentialist view, in that the regulative impact of non-state actors and the diversity of regulatory sources are recognised. However, there are two main differences between the pragmatist and the functionalist view of regulation. First, conceptually, the legal pragmatist treats the sources of regulation as practices rather than as tools, while regulation is treated as an activity rather than as a practice. This distinction is not purely terminological. Treating the sources of regulation, such as law and design, as practices conduces to a more grounded analysis of the manner in which regulation unfolds in the context of each practice. Casting those sources as neutral tools entails a reductive and abstract interpretation of the reality of regulative activity. Second, the pragmatist perspective on regulation points to a clear distinction between regulative activity and governance; that distinction is wholly absent from functionalism. The pragmatist rejects the flat ontology of functionalism and treats the legitimacy of various regulative activities as nuanced. They are also open to the possibility of accountability for ineffective, inefficient, or otherwise illegitimate regulative activities.

98 Hood (n 8).

99 Nikolas Rose and Peter Miller, 'Political Power beyond the State: Problematics of Government' (1992) 43 The British Journal of Sociology 173.

7. Conclusions

This article provides a theoretical analysis of RBD, which is a growing research field that focuses on the regulative activity of technological design. The analysis is situated within the regulatory governance scholarship, where the two prevailing views, namely the essentialist and the functionalist perspectives, are introduced and criticised. By exploring the concept of design based on design studies, and relying on pragmatist epistemology, the article advances a third, pragmatist conception of RBD. According to this view, regulation is understood in reference to the rule-making activity (that is, the *regulativity*) of social practices, design being one.

The article makes two important contributions to the theoretical treatment of RBD. First, a pragmatist understanding of RBD enables an approach to design as a practice, adopting a more dynamic perspective of the regulative activity. To make the distinction clearer, consider that design is both a noun and a verb. In the essentialist and the functionalist traditions, design has been approached as a noun, statically, as a physical output. The pragmatist alternative offers a view of design as a verb, that is, as dynamic processes that materialise within nonstationary practices and result in rule-making activity. Second, a pragmatist outlook on RBD enables a distinction between the concepts of regulation and governance. Existing approaches either equate regulation with governance or abstract the concept of governance from regulatory discussions. According to this pragmatist proposal, governance and regulation have a similar rule-making nature. The difference, however, lies in governance being a meta-regulative activity, a function which it discharges by regulating how other practices regulate. As a result, the pragmatist approach offers a theoretical basis for a layered treatment of multiple regulative practices that operate jointly in a shared regulatory environment. The nuanced view presented through the pragmatist approach may be instrumental for addressing the legitimacy challenges that RBD faces, as presented in this article. By adequately conceptualising the relationship between regulation, governance, and design, RBD practices may be carefully steered, through governance, to operate in function of the public, societal interest, thus mitigating its legitimacy issues.