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**Article**

**Patent Law’s Audience**

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“Of course it would have been better for all concerned . . . if [plaintiff patent holder] Mr. Lough had read our prior opinions before he became an inventor. . . .”<sup>1</sup>

## INTRODUCTION

Who *does* read patent law? Not Steven Lough, in all likelihood. He was a boat mechanic working at a marina in Sarasota, Florida. After observing that the stern drives of Brunswick inboard/outboard boats frequently failed due to corrosion, he designed a new seal assembly and built six prototypes using his grandfather’s metal lathe.<sup>2</sup> He installed one of the prototypes on his own boat and gave the others away.<sup>3</sup> Eventually he got a patent, and when Brunswick introduced a stern drive having an allegedly similar seal assembly, Lough sued for infringement. He won a jury verdict, but the Federal Circuit overturned it on appeal, concluding that Lough’s patent should have been held invalid because Lough had put the prototypes into public use more than a year before filing his patent application.<sup>4</sup> According to the panel majority, Lough had neglected to keep adequate documentation that might have helped him prove that he was merely testing the seal assembly to determine whether it worked.<sup>5</sup> Of course, as Judge S. Jay Plager caustically remarked, prior to building the prototypes, Lough had presumably not mastered the jurisprudence of the experimental use negation of the public use bar to patentability.<sup>6</sup>

1. *Lough v. Brunswick Corp.*, 86 F.3d 1113, 1124 (Fed. Cir. 1996) (Plager, J., dissenting).

2. *Id.* at 1115–16.

3. *Id.* at 1116.

4. *Id.* at 1122 (invoking 35 U.S.C. § 102(b)).

5. *Id.*

6. *Id.* at 1124 (Plager, J., dissenting). It still isn’t clear whether the Federal Circuit as a whole had mastered it, either. *See Lough v. Brunswick Corp.*, 103 F.3d 1517, 1517–18 (Fed. Cir. 1997) (order denying rehearing en banc, accompanied by separate opinion of Judge Lourie in support of the order and four opinions from Judges Newman, Plager, Michel, and Rader, respectively, dissenting from the order). In any event, Judge Lourie’s opinion for the panel

In truth, we think it would be only a mild exaggeration to assert that no one actually reads the patent law in its raw state. Really, who would? In the nineteenth century, it was not unusual for popular newspapers or magazines to report at length on patent decisions, ostensibly for an idealized readership of ingenious Yankee mechanics or yeoman farmers.<sup>7</sup> Perhaps the notion of the paradigmatic informed citizen inventor was always a caricature,<sup>8</sup> or perhaps times and reading habits have changed. Regardless, it is at best a fond Jeffersonian conceit to suggest that modern research scientists pass their days poring through the prodigious output of the U.S. Court of Appeals for the Federal Circuit—or that they have a clear notion of who or what the court even is. Moreover, the obvious retort—that modern patent professionals read the patent law and retransmit the text to their clients—raises additional questions, and assumes (incorrectly, we think) that patent professionals actually do get their patent law predominantly from source materials, rather than from intermediaries.<sup>9</sup>

The fact is that patent law is probably much more remote from its putative end users than patent law rhetoric conventionally admits. Two types of problems result. First, remoteness complicates patent law's *ex ante* incentives story. In the traditional version of the story, patent law incents inventors' actual decisions about whether to work on inventions, or inventors' decisions to disclose them,<sup>10</sup> and patent rulemaking is an exer-

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majority in *Lough* insisted that “[t]he law does not waive statutory requirements for inventors of lesser sophistication.” *Lough*, 86 F.3d at 1122.

7. See Mark D. Janis, Daniel Webster's Patent Cases 8 (Sept. 25, 2012) (unpublished manuscript) (on file with author) (citing press coverage of patent litigation involving Goodyear's patent for vulcanized rubber).

8. See generally Mark D. Janis, *Patent Abolitionism*, 17 BERKELEY TECH. L.J. 899, 904–22 (2002) (alluding to the “heroic inventor” motif of nineteenth century patent law); Mark A. Lemley, *The Myth of the Sole Inventor*, 110 MICH. L. REV. 709, 712–14 (2012) (arguing that most inventions are made by multiple teams working concurrently).

9. There is a parallel set of questions about who (if anyone) actually reads the text of patent documents. The answers are important for many patent law doctrines, and we think it problematic simply to assume a homogeneous audience of enlightened inventors. Justice Breyer may have indulged in such an assumption in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1297 (2012) (“[T]he ‘administering’ step simply refers to the relevant audience, namely doctors who treat patients with certain diseases with thiopurine drugs . . . . [T]hese clauses tell the relevant audience about the [natural] laws while trusting them to use those laws appropriately where they are relevant to their decisionmaking.”).

10. See, e.g., Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1024–30

cise in intricately sculpting those incentives to create a perfect fit with the overriding normative and constitutional goal of promoting progress in the useful arts.<sup>11</sup> But that account assumes that the law's incentives actually are communicated, in some form, to inventors. If modern patent law is all but incomprehensible to inventors, then who does receive patent law's messages about incentives? How are those messages rebroadcast to inventors? How certain are we that the subtleties of patent law's putative incentive effects are not lost in translation?

Second, patent law's remoteness presents serious challenges for the design of the patent system's institutions and rules. It creates great pressure on the system to develop intermediaries that can function to refine the formal patent law so that its audience can receive a comprehensible essence. It creates pressure to perfect those intermediaries so as to minimize the chance that they will introduce translation errors. And it suggests that in elaborating patent law rules, Congress, the courts, and the United States Patent and Trademark Office (USPTO) need a better understanding of the composition of the intended audience, and need to understand how and when to invoke the intermediaries that may connect rule to audience.

In this paper, we argue that the patent law could operate more effectively if it (1) incorporated a more realistic conception of its audience, and (2) devised pragmatic mechanisms—intermediaries—to bridge the distance between formal patent law rules and the targeted audience for those rules. In Part I, we synthesize literature pertinent to the general problem of designing law in view of the relevant audience. We identify and define two considerations that guide this design exercise, proximity and complexity, and offer a simple matrix to illustrate the proximity/complexity tradeoff in the design of rules. In the remainder of the paper, we turn to patent law. In Part II, we conceptualize the patent system as a complex network involving a multiplicity of speakers, intermediaries, and audiences. Among other things, we use this network metaphor to show that many patent rules lack proximity to their putative audience. In light of that observation, in Part III, we reevaluate specific patent law doctrines in view of the proximity/complexity tradeoff, of-

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(1989) (explaining the incentive to invent and incentive to disclose theories). In another incarnation, the patent right encourages investors to fund innovation. *Id.* at 1036–38.

11. See U.S. CONST. art. I, § 8 (providing that one of the powers of Congress is to “promote the progress of science and the useful arts”).

fering our own normative choices about how proximity and complexity might be rebalanced in the design—or redesign—of particular patent law rules.

### I. DESIGNING LEGAL RULES IN VIEW OF AUDIENCE INTERESTS

Law must communicate to be effective. That proposition is intuitive; restating it may seem trite. A legal regime (such as patent law) may be understood as a communication system, one in which rulemaking institutions broadcast messages, adjudicative institutions interpret and retransmit them to stakeholders, and stakeholders act based on the rules and deliver feedback, ultimately to the rulemaking institutions.<sup>12</sup> This observation, likewise, is probably trivial. Virtually anything in modern experience can be conceptualized as information and situated in a network where information flows from one node to another and is processed, refined, or distorted.<sup>13</sup>

Obvious though it may be, the network metaphor could enrich traditional legal analysis by expanding its perspective. Traditional legal analysis focuses exquisite attention on designing rules, and, perhaps, on designing institutions to promulgate and interpret those rules. It has paid far less attention to the mechanisms by which rules are transmitted—or not—to their ultimate target audiences.<sup>14</sup> Traditional legal analysis at its

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12. See Ron Levi & Mariana Valverde, *Studying Law by Association: Bruno Latour Goes to the Conseil D'Etat*, 33 LAW & SOC. INQUIRY 805, 806 (2008) (observing that Latour's work "treats law as a network of people and of things in which legality is not a field to be studied independently, but is instead a way in which the world is assembled"); Boaventura De Sousa Santos, *Law: A Map of Misreading: Toward a Postmodern Conception of Law*, 14 J. LAW & SOC. 279, 299 (1987) (characterizing law as a "network of legal orders"); see also Dan L. Burk, *Law as a Network Standard*, 8 YALE J.L. & TECH. 63, 72 (2005) (exploring law's network effects); *infra* Part II (applying these concepts to the patent system).

13. See, e.g., JAMES GLEICK, *THE INFORMATION: A HISTORY, A THEORY, A FLOOD* 8–9 (2011) ("Life spreads by networking.").

14. For simplicity, we are referring to "audience" as any entity that receives a message, whether directly or indirectly. In doing so, we are taking some liberties with terminology. Linguists define the "addressee" as the entity directly receiving the communication and the "audience" as the collective set of entities for whom the communication is ultimately intended. Drury Stevenson, *To Whom Is the Law Addressed?*, 21 YALE L. & POL'Y REV. 105, 116–17 (2003). Some scholars have found it useful to subdivide the audience even further. See, e.g., Henry E. Smith, *The Language of Property: Form, Context, and Audience*, 55 STAN. L. REV. 1105, 1134 (2003) (defining auditors, overhearers, and eavesdroppers).

most myopic obsesses over nodes, discounting the fact that those nodes exist in a complex and, perhaps, dynamic networked system that may involve a multitude of participants who experience the system in dramatically different ways.

Our interest in the audience perspective is pragmatic. We leave for others the larger jurisprudential implications.<sup>15</sup> We seek a diagnostic tool for identifying design problems in the patent law system and for guiding efforts to address those problems. We suspect that other areas of law may benefit from a similar treatment, but such extrapolations fall outside the scope of our work here.

With this goal in mind, we have examined literature applying principles of sociolinguistics,<sup>16</sup> network science,<sup>17</sup> and information theory to law, and we have taken account of more traditional scholarly endeavors in areas such as property theory, all to develop a conception of the role of audience in the design of legal systems. Based on this study, we have defined two rudimentary design parameters. We refer to the first as *proximity*, a measure of the extent to which formal law communicates directly to its putative audience. We call the second *complexity*, to refer to the extent of information that a formal legal rule attempts to convey. We can order these parameters in a simple two-by-two matrix to illustrate how they interact in the design of any individual legal rule. In this section we explain our concepts of proximity and complexity, along with the proximity/complexity matrix that frames our analysis.<sup>18</sup>

#### A. PROXIMITY

Formal law sometimes communicates directly with those bound by it. Consider, for example, a speed limit sign displayed on a public road. The rule of law is communicated directly to

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15. See, e.g., Anthony D'Amato, *Can Legislatures Constrain Judicial Interpretation of Statutes?*, 75 VA. L. REV. 561, 563–65 (1989) (treating legislative rulemaking as a process of communication and asking whether the legislature can engage in audience pre-selection and preparation).

16. See generally Stevenson, *supra* note 14, at 116–23 (discussing sociolinguistic features of written legal formulas).

17. See generally Katherine J. Strandburg et al., *Law and the Science of Networks: An Overview and an Application to the "Patent Explosion,"* 21 BERKELEY TECH. L.J. 1293 (2006) (applying a network science perspective to patent law).

18. For purposes of this initial discussion we are treating audience as an empirical fact. Later we discuss the possibility of treating audience prescriptively, as another variable in the design of rules. See *infra* Part III.

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the relevant audience, car drivers. The legal text is literally spelled out for the ultimate audience and presented in such a manner that no specialized expertise is required in order to discover the text. We could characterize such a rule by saying that there is little distance between the speaker (the state) and the audience (the drivers).<sup>19</sup>

Such direct communication of the law to the relevant audience does not always occur. Often, parties bound by formal legal rules have never read the texts, may not know where to find them or how to read them if they could find them, and see little need to do so in any event. In such instances, other mechanisms forge an indirect connection between formal law and its audience. Background knowledge, norms, or customs may coincide so closely with the formal law that actual recourse to the formal legal text would be redundant. For example, although most may not understand the subtle differences between murder and homicide, everyone knows that taking the life of another is a crime, absent some justification such as self-defense. The failure to read the statute that defines murder does not reduce the effectiveness of the law in enforcing the proscriptions on homicide.

Alternatively, formal law may be communicated to its ultimate audience by way of intermediaries. Intermediaries may be individuals, institutions, or legal constructs. Perhaps the clearest example is the practicing bar. Lawyers “transmit[] the law in distilled form to the citizenry. They change the law from its original form . . . into ‘conduct rules’ addressed to the citizen.”<sup>20</sup> In some areas—such as patent law—the technical precepts of the law may not be rooted in background norms, or there may simply not be very many of them on which to rely. Thus, for designing the patent law system, it is critical to develop intermediaries and situate them in such a way as to facilitate efficient dissemination of the formal rules or, as we discuss in more detail in the next section, elaborate legal constructs to help translate the law.

To capture the notion of a degree of separation between the entity promulgating a formal legal rule and the audience tar-

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19. Of course, it is also important that the rule at issue is inherently simple. A placard posted outside a lab saying, “Warning—Do Not Infringe Patents” could also be argued to speak directly to its ultimate target audience, but the message may be too complex for that audience to decode under the circumstances. See *infra* Part I.B for an explanation.

20. Stevenson, *supra* note 14, at 147–48 (referring to criminal law).

geted by that rule, it may be useful to speak of a rule's *proximity* to its audience.<sup>21</sup> A legal rule that is distant from its audience may be subject to additional design constraints as compared to a rule that is proximal to its audience. Indirectly, proximity may express information about the character of the audience. We might characterize a rule as being distant from its audience if the rule attempts to speak directly to the general public, especially in a context like patent law in which the general public is unlikely to have internalized much background knowledge about the system and its rules and institutions.<sup>22</sup> We may also speak in institutional terms, of rulemaking institutions that are generally distant from the audiences that they purport to target, such that the rules promulgated by those institutions will frequently present a proximity problem. For example, bankruptcy law is directed to individuals, yet we do not realistically expect the general public to know the details of how bankruptcy works, aside from recognizing that it is an option for those whose debts exceed their assets. The debtor is ultimately quite remote from the law.

Proximity is important in legal regimes that impose legal obligations *ergo omnes*. Real property law furnishes a useful illustration of this point, even though our focus in the remainder of the paper is patent law.<sup>23</sup> Property is a form of communication, as Carol Rose has pointed out.<sup>24</sup> As she puts it, "[l]anguage, in the broader sense of symbolism and communication, makes property possible"<sup>25</sup> in that property claimants articulate their claims, and others take notice of those claims and acquiesce in them. Similarly, Henry Smith has explained that the efficient operating of property regimes requires that a dif-

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21. A similar measure appearing in the literature of network sciences is the "closeness" metric. *See, e.g.*, PETER R. MONGE & NOSHIR S. CONTRACTOR, THEORIES OF COMMUNICATION NETWORKS 38–39 (2003) (using a measure of "closeness" to evaluate an entity's ability to access information through a network, where closeness refers to the extent to which the entity is connected, directly or indirectly, to other entities in the network); *see also id.* at 223–39 (discussing concepts of proximity in theories of social networks).

22. *See infra* note 47 and accompanying text.

23. Criminal law presents another striking example. Vast segments of it are relevant to everyone's general daily affairs, and most people substantially abide by it without ever consulting or comprehending the actual text. Under one view, instrumentalities of the state serve as intermediaries, bridging the gap between the text and those bound by it. *See Stevenson, supra* note 14, at 167.

24. *See* Carol M. Rose, *Introduction: Property and Language, or, the Ghost of the Fifth Panel*, 18 YALE J.L. & HUMAN. 1, 3 (2006).

25. *Id.*

fuse audience understand the communicative message embodied in a claim to property rights.<sup>26</sup> To restate these assertions, property claims, and the rules that construct those claims, often will not have the benefit of close proximity, because often those property claims and rules must speak to a diverse audience having no necessary prior relationship with the property claimant. The problem may be especially acute in intellectual property, where little in the way of customary practice or other contextual clues are available to guide public behavior.<sup>27</sup>

## B. COMPLEXITY

As even the most casual student of the law well knows, some legal rules are easier to decode than others. Above, we observed that the ease with which this process can occur is, in part, a function of the proximity of the intended audience to the institution promulgating the rule. Here, we note that the ease of decoding should also be a function of the rule's inherent *complexity*.

We regard this as another largely obvious proposition that borrows elementary insights from information theory. In information-theoretic terms, any networked communication system should take into account the sheer quantity of information

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26. See Henry E. Smith, *The Language of Property: Form, Context, and Audience*, 55 STAN. L. REV. 1105, 1117–22 (2003) (discussing rules of possession and context needed for the audience to understand them). For example, in the classic case of *Pierson v. Post*, adoption of the “reasonable prospect of catching” rule for possession of the hunted fox requires knowledge of the context of the hunt, in contrast to the clearer, non-contextual rule of “certain control.” *Id.* at 1117–18.

27. One key contextual clue that intellectual property lacks is tangibility. While owners of real property—and the rest of us who must abide by the laws of property on a daily basis—may not know the real difference between a life estate and a fee simple absolute, we do know that the relevant property rights are tethered to some “thing”—the land—and there may be abundant physical signs that corroborate a claim of rights in that thing—say, fences. In contrast, intellectual property, and patents in particular, do not have such tangibility to anchor the owner's instincts or knowledge of the rights and requirements. Moreover, unlike real property, the scope of a patent's right to exclude shifts over time, further complicating the audience's task of decoding the relevant rules. See, e.g., Kevin Emerson Collins, *The Reach of Literal Claim Scope into After-Arising Technology: On Thing Construction and the Meaning of Meaning*, 41 CONN. L. REV. 493, 493 (2008); Christopher A. Cotropia, “After-Arising” *Technologies and Tailoring Patent Scope*, 61 N.Y.U. ANN. SURV. AM. L. 151, 174 (2005); Timothy R. Holbrook, *Equivalency and Patent Law's Possession Paradox*, 23 HARV. J.L. & TECH. 1, 15–29 (2009).

contained in a message per unit cost of delivery.<sup>28</sup> For purposes of applying this idea to legal information, information quantity may be too crude a concept, given that the information in a legal rule cannot be assumed to be divisible into substituents that are simply fungible. We prefer to use the label *complexity*. A highly complex rule, as we define it, is difficult to decode, but this presents little concern if the relevant audience is small and expert. It presents greater concern as the audience becomes large and more diverse in its abilities and familiarity with the legal regime at issue.<sup>29</sup>

We do not mean to pretend that the concept of complexity as we have defined it is comprehensive, nor do we intend to invoke theories of complexity that have been applied to explain the evolution of law.<sup>30</sup> We simply mean to suggest that complexity is a handy tool for the immediate task.

Although he does not use the term “complexity,” Henry Smith’s discussion of the tradeoff between information intensiveness and audience extensiveness helps us illustrate what we mean by rule complexity and its connection with audience.<sup>31</sup> Smith contrasts contract and property.<sup>32</sup> Contract provisions, Smith asserts, can convey large amounts of information per unit costs because the audience—the parties to the contract—is very small, expert, related (by virtue of having negotiated the contract), and fully aware of the relevant context.<sup>33</sup> The parties, knowing the context, will be able to take more information accurately from fewer words, even if those words are idiosyncratic.<sup>34</sup> These conditions, the argument goes, do not exist with regards to property claims, and so property rules cannot convey

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28. See Smith, *supra* note 26, at 1110–11 (referring to information intensiveness: the amount of information per unit cost of delineation).

29. We see some connections between our notion of rule complexity and the debate over rules versus standards. See, e.g., Mark D. Janis, *Rules v. Standards for Patent Law in the Plant Sciences*, 24 LAW IN CONTEXT 44, 48–50 (2006) (one of many works showing how the debate may be relevant in intellectual property law).

30. See J.B. Ruhl, *The Fitness of Law: Using Complexity Theory to Describe the Evolution of Law and Society and its Practical Meaning for Democracy*, 49 VAND. L. REV. 1407, 1437–48 (1996) (exploring the relevance of complexity theory).

31. Smith, *supra* note 26, at 1111.

32. *Id.* at 1110–11.

33. *Id.*

34. *Id.*

the same information intensity—or complexity, in our language.<sup>35</sup>

We agree with this comparison as far as it goes, but we can extend the contract discussion to show why both complexity and proximity are important. Suppose that the contract is not a bilateral, negotiated agreement, but a click-wrap license on a software product. The audience is no longer (necessarily) small, expert, related, or immersed in the relevant context. The terms of the contract may be the same as those in the former example—that is, they may have the same complexity—but the audience is no longer as proximal to the source of the contract provisions.<sup>36</sup> Both proximity and complexity matter in designing the relevant rule.

### C. THE PROXIMITY/COMPLEXITY TRADEOFF

Having defined the concepts of proximity and complexity as we intend to use them here, we now show how, at a general level, those variables interact in the design of rules. Our central proposal here is simple: in the design of legal rules, there is a tradeoff between proximity and complexity. Rulemaking exercises that ignore this tradeoff are not likely to produce rules that operate as intended.

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35. See *id.* Smith goes further, suggesting a contrast between rule formalism and rule contextualism, where formalism signals a condition of low information-carrying capacity and is called for in property, while highly contextualized rules work in contracts. *Id.* at 1112. See generally Thomas W. Merrill & Henry E. Smith, *Optimal Standardization in the Law of Property: The Numerus Clausus Principle*, 110 YALE L.J. 1, 3–9 (2000) (asserting that more formal systems are needed in order to make property rules accessible). But formalism carries much extraneous intellectual baggage, and we don't think it illuminates our inquiry on balance, although there is an interesting juxtaposition with patent law literature criticizing the Federal Circuit's reliance on bright-line rules. See John R. Thomas, *Formalism at the Federal Circuit*, 52 AM. L. REV. 771, 773–75 (2003).

36. We can imagine other contingencies. For example, third parties may be affected by the contract and thus may be part of the relevant audience.

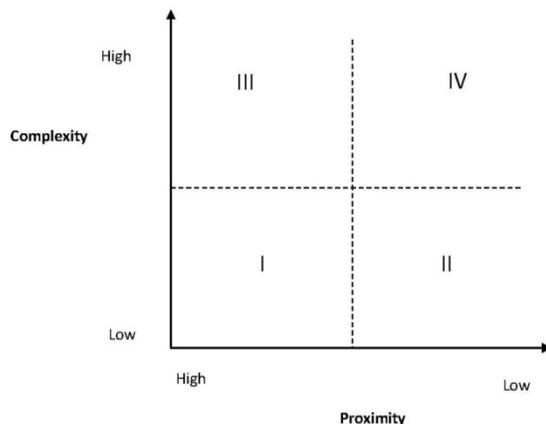
**Figure 1**

Figure 1: The figure demonstrates the relationship between rule complexity and speaker-audience proximity.

Our central focus here is on rules that fall into Quadrant IV—that is, rules that purport to convey highly complex content to a distant (low proximity) audience. Those rules are candidates for redesign. They need either to be restructured to reduce their complexity (moving them towards Quadrant II), or they need to be keyed to take advantage of intermediaries, or keyed to invoke other sorts of heuristics, to increase the effective proximity (moving them towards Quadrant III).<sup>37</sup> As we will argue below, patent law includes too many Quadrant IV rules.<sup>38</sup>

Our framework is directed to individual rules; it presumes that any given area of law may include rules that populate different quadrants. For example, in patent law, the USPTO has promulgated regulations that spell out with considerable specificity the DNA sequence information that a patent applicant must supply in order to comply with the patent law's general disclosure requirements for patent claims directed to isolated genes or other DNA inventions.<sup>39</sup> These regulations are Quadrant III rules in our framework: they are highly technical in content (and thus may be considered highly complex) but they

37. Or both, which may place them in the domain of Quadrant I.

38. See *infra* Part III.

39. 37 C.F.R. §§ 1.801–1.821 (2011).

are directed to a small circle of biotechnology patent professionals (and so are highly proximal to their intended audience, with little or no need for comprehensive transmission to a more diffuse, general audience). Many other patent law rules are Quadrant IV rules, or are candidates to become Quadrant IV rules because rulemakers are insufficiently sensitive to proximity and complexity.

## II. MAPPING THE MODERN PATENT SYSTEM: AUDIENCE AND THE PROXIMITY/COMPLEXITY TRADEOFF

Our ultimate goal is to apply the concept of audience, and particularly the idea of the proximity/complexity tradeoff, to the design of patent law rules. The next step towards that goal is to provide a descriptive account of patent law's audience. We find that patent law's audience is rich, complex, and varied. We reject the notion that patent law's audience, as a descriptive matter, is a select and homogeneous group of sophisticates. We also reject the notion that patent law's audience is essentially passive. Instead, we see patent law's stakeholders as residing within a complex network in which stakeholders may receive information (in the form of legal rules), retransmit it to others, and/or provide feedback to the institutions responsible for propagating the rules. We find it convenient to refer to the rhetoric of networks in rendering this description. The early American patent system provides a useful contrast to the modern system, so we turn briefly to it before depicting the modern system.

### A. AUDIENCE IN THE EARLY AMERICAN PATENT SYSTEM

Many of the rules of modern patent law, including many that will persist after the America Invents Act of 2011 comes into full effect, were developed in the early nineteenth century. In one standard rendition, now dismissed as mythical, the entire American patent system connected in some way to the persona of Thomas Jefferson: he had (it was said) written the legislation that became America's first patent act;<sup>40</sup> he examined the early patent applications (or at least had been authorized to

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40. See *Graham v. John Deere Co.*, 383 U.S. 1, 7–10 (1966) (naming Jefferson as a drafter of the Patent Act of 1790 as well as its “moving spirit”). See generally *Patent Act of 1790*, 1 Stat. 109–12 (1790).

do so); and, by all accounts, he was keenly interested in invention.<sup>41</sup>

While the early American patent system was more than a mere Jeffersonian soliloquy, the stakeholders were indeed few. Two judges and a select group of lawyers handled virtually all patent litigation.<sup>42</sup> There was no Patent Office, no formal patent bar, and only a few entrepreneurs whose products were likely to be distributed on a commercial scale.<sup>43</sup> The diagram below portrays the system: Congress and a small subset of the judiciary (along with one treatise writer) served as the primary source of rules,<sup>44</sup> and a select group of lawyers and inventors constituted the audience, although they also provided some feedback.<sup>45</sup> We have not included the general public on the diagram. The general public had a stake in the early patent system—at a minimum, they were bound to respect patent rights, so infringement rules were relevant to them. But given the limited nature of the industrial economy, few among the general public would have been engaged in activities that would have exposed them to large-scale patent infringement liability risks.

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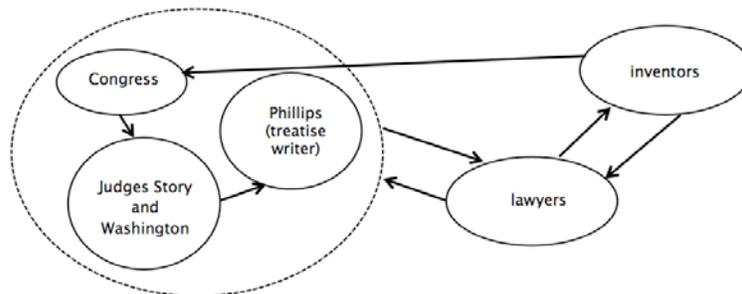
41. See *Graham*, 383 U.S. at 7–10 (valorizing Jefferson's contributions to the early patent system). *But cf.* Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent "Privilege" in Historical Context*, 92 CORNELL L. REV. 953, 955 (2007) (refuting the "Jeffersonian story" of early patent law); Edward C. Walterscheid, *The Use and Abuse of History: The Supreme Court's Interpretation of Thomas Jefferson's Influence on the Patent Law*, 39 IDEA 195, 217 (1999) (explaining Jefferson's relatively modest role in early patent law development).

42. See Janis, *supra* note 7, at 5–6 (explaining that the jurisdictional organization of the federal courts combined with the "geographic concentration of manufacturing and technical innovation in New England and the Mid-Atlantic states" resulted in most of the country's patent cases being heard by either Justice Joseph Story or Justice Bushrod Washington).

43. See generally Andrew P. Morriss & Craig A. Nard, *Institutional Choice & Interest Groups in the Development of American Patent Law: 1790–1865*, 19 SUP. CT. ECON. REV. 143, 149–79 (2011) (discussing the statutory, doctrinal, and socio-economic evolution of the antebellum patent law system).

44. For clarity, we have identified this group of legal "speakers" together, as indicated by the dashed oval. We have included one early treatise writer, Willard Phillips, to make the point that at the time, there was no systematic practice of reporting cases, so treatise writers played a major role in conveying information about case decisions. The relevant treatise is WILLARD PHILLIPS, *THE LAW OF PATENTS FOR INVENTIONS* (Boston, Am. Stationers, Co. 1837).

45. In the diagram we use the reverse arrows to indicate feedback. An illustration of the feedback from inventors to legal "speakers" may be found in Walterscheid, *supra* note 41, at 207–08 (discussing a petition from an inventor protesting proposed changes to the Patent Act of 1790 presented before the House in early 1791).



In the early patent law landscape that we have depicted, there was little risk of a proximity problem. Indeed, the characteristics of the early American patent system are reminiscent of the conditions that network theorists attribute to the so-called “small-world model.”<sup>46</sup> This was the landscape in which some important patentability rules developed—e.g., rules governing certain aspects of patentability over the prior art. Those rules remain in effect today, even though a map of the modern system differs greatly from this one, as we detail in the next section.

#### B. AUDIENCE IN THE MODERN PATENT SYSTEM: UNFAVORABLE PROXIMITY FOR COMPLEX RULES?

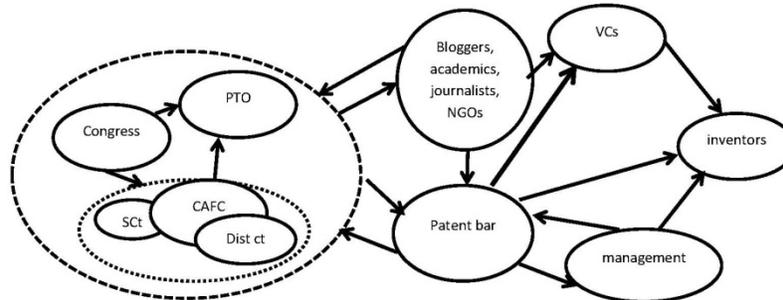
Most observers would readily agree that the modern American patent system is profoundly different from its nineteenth century predecessor.<sup>47</sup> The difference of greatest salience to the discussion in this Article is the difference in proximity. Although many of the patent system’s rules still purport to affect directly the investment decisions of inventors,<sup>48</sup> inventors are no longer as proximate to the formal law or the law-making institutions. Innovators rarely interact directly with the formal law. Instead, they interact with the law through intermediar-

46. See, e.g., M.E.J. Newman & D.J. Watts, *Scaling and Percolation in the Small-World Network Model*, in *THE STRUCTURE AND DYNAMICS OF NETWORKS* 310, 310 (Mark Newman et al. eds., 2006) (explaining that in such a model, most entities are connected by a short path through the network, and there is high “transitivity,” meaning a high probability that there is a high likelihood that two entities are connected given their common connection to a third entity).

47. See, e.g., Janis, *supra* note 7, at 1 (contrasting the antebellum patent system and economy with the sophisticated institutions and corporations that are the hallmarks of the modern patent system).

48. We refer here to investment decisions of many varieties—financial resources, time, efforts, etc.

ies—and very likely through multiple layers of intermediaries. The diagram below attempts to illustrate these ideas:



The diagram reflects the growing *institutional* complexity of the patent system, a phenomenon that compounds the inherent *rule* complexity of many individual patent law rules. Many of the institutional stakeholders have become more internally complicated over time,<sup>49</sup> and their relationships with each other are likewise increasingly complex. And the diagram barely does justice to the actual institutional complexity of the system; it is not comprehensive.

The diagram does offer a view as to the composition of modern patent law's audience. It includes, first, the patent bar and a growing range of bloggers, academics, and journalists, all of whom receive and retransmit the law. They are particularly important intermediaries in our depiction of the system. If, as we suspect, many lawyers receive the law primarily via these sources rather than by reading the actual opinions (that is, if we are overly optimistic in drawing a direct line of connection between the patent bar and the entities that promulgate formal patent law), then these sources are critical to the transmission of the law.<sup>50</sup> Regardless, for any given rule of patent law, it may

49. For example, the diagram represents the USPTO as a single node, but in fact the USPTO is a large and complicated organization that must frequently mediate between competing internal interests.

50. Some may argue that we give too prominent a role to patent law academics in this depiction. That may be true, but we are academics and we ask forgiveness if we have a grandiose view of our own importance in the patent law landscape. In our depiction, the nodes representing both the patent bar and bloggers, academics, and journalists have high "betweenness," meaning that a large number of paths in the network pass through these nodes. See generally MONGE & CONTRACTOR, *supra* note 21, at 38.

be reasonable to assert that the immediate audience is the audience of expert lawyers and commentators, even though the rule purports to be keyed directly to the inventor.

The diagram also includes other actors—venture capitalists, corporate management responsible for research and development funding decisions—and the actual system no doubt includes many others, all of whom may well have a role in filtering and repackaging the law to make it digestible by inventors. We think it incorrect to assume that entities such as these are not, or should not be, a part of patent law’s target audience. Yet, at least on the surface, patent law rules seem to be made based on the assumption that the message embedded in those rules will be delivered without alteration to the ultimate, less proximate target audience of scientists and engineers.

We recognize that it would be easy to quarrel with the details of the diagram. The entities could be arrayed differently, some subtracted, others added; the arrows indicating the interconnections could be rearranged. But that quarrel simply highlights our point: the patent system relies heavily on intermediaries, but these intermediaries are not necessarily formalized or vetted. Moreover, the landscape is dynamic—the picture changes over time, sometimes quite rapidly. In addition, the institutional actors may differ in identity, and certainly in importance, across different areas of technology.<sup>51</sup>

Our diagram is deliberately incomplete in one respect: it does not portray the “general public” per se as occupying any discrete node in the diagram. We hesitate to confine the general public to a single node—the risk is too great of minimizing the role of the general public as the ultimate stakeholder in the system, and it may be too difficult to represent with simple arrows the channels through which legal information about patents is transmitted to the general public. As we will point out,<sup>52</sup> however, the design of some patent law rules must take into account the prospect of the general public as the putative audience. Indeed, some current patent law rules encounter a severe proximity problem because they purport to convey prescriptions to the general public. The problem arises in connec-

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51. This is another manifestation of the familiar point that patent law is, or is becoming, technology-specific. See Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1589–95 (2003).

52. See *infra* Part III.A.

tion with a number of patent infringement doctrines, as we discuss in the next section.<sup>53</sup>

### III. REDESIGNING PATENT LAW IN VIEW OF AUDIENCE

Consideration of law's audience should be an important tool in designing any formal legal regime. In the patent context, where concerns of public notice drive much of the doctrine, a rich inquiry into the appropriate audience for particular patent rules is critical. The proximity/complexity metric we offer in this Article provides a straightforward basis for assessing the efficacy of patent doctrine, one which the courts or Congress could use in shaping individual patent rules. If the patent system is to operate appropriately, then policymakers should attempt to shift individual patent law rules out of Quadrant IV by either using a bridging heuristic to reduce the distance between the speaker and the audience or by simplifying the rules to reduce complexity.<sup>54</sup> A considered evaluation of audience, therefore, provides a useful tool by which lawmakers could reform patent law.

This section highlights certain patent rules that could benefit most from a reassessment under our framework. We begin with doctrines of patent scope. These rules determine the extent of the patent owner's right to exclude. These doctrines, therefore, operate to establish a patent's intangible "fence," and thus directly implicate public notice concerns.

Patent scope doctrines are generally complex, but yet they purport to speak to the general public. As our framework predicts, such doctrines are problematic; they do not respect the

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53. As patents and the patent system become more salient in everyday life, we can expect to see a broader discourse about the disconnect between the general public and the institutions of the patent system. Regarding increased salience, see, for example, Clarisa Long, *Information Costs in Patent and Copyright*, 90 VA. L. REV. 465, 487–88 (2004) ("Patented nonparadigmatic goods such as business methods or sports moves, by contrast, affect a larger number of observers."). See also Shubha Ghosh, *Race-Specific Patents, Commercialization, and Intellectual Property Policy*, 56 BUFF. L. REV. 409, 410–11 (2008) (highlighting the media coverage of a heart disease drug patented for use solely in African Americans); Timothy R. Holbrook, *The Expressive Impact of Patents*, 84 WASH. U. L. REV. 573, 579 (2006) (arguing that patents have the potential to imply governmental preferences or disfavor towards some members of society, particularly in the biotechnology arena); Jonathan Kahn, *Race-ing Patents/Patenting Race: An Emerging Political Geography of Intellectual Property in Biotechnology*, 92 IOWA L. REV. 353, 360 (2007) ("The new commodity value of patented race depends on its ultimate relationship to the living, breathing people who identify with particular racial groups.").

54. See *supra* Part I.C.

proximity/complexity tradeoff. We show how the law has attempted to respond: by developing constructed audiences to increase the effective proximity between the rulemaking institutions and the audience. Heuristics such as the hypothetical person having ordinary skill in the art (PHOSITA) and the “reasonable competitor” attempt to serve in this role, and we critically evaluate their performance.

We then turn to patentability doctrines. Here, our analysis is more selective. We focus on longstanding rules of patentability that bar inventors from patent protection based on their own prior disclosures or sales activities—the so-called statutory bars to patentability. We show that these rules suffer from a similar tradeoff problem: they purport to convey subtle incentives (high complexity) directly to inventors (unfavorable or low proximity). A reassessment of these rules is in order, especially in view of the passage of new patent legislation, as we explain.

#### A. THE PROXIMITY/COMPLEXITY PROBLEM WITH PATENT SCOPE DOCTRINES

Patent scope doctrines suffer from a severe proximity/complexity problem. The proximity aspect of the problem is so fundamental that it occasions little contemporary comment. Patents operate in a manner that might be likened to statutes: all members of the public are subject to the exclusive rights of patents, regardless of whether they are actually aware of a given patent.<sup>55</sup> Infringement is a strict liability tort, and ignorance of a patent offers no protection from liability.<sup>56</sup> As such, at least in theory, every member of the population is a potential infringer, and there is a paramount need to provide notice to the general public of the boundaries of any given patent grant.<sup>57</sup>

The complexity problem is all too familiar to the patent community. One of the most difficult aspects of patent law is determining the scope of the right to exclude afforded by the

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55. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 987 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

56. See *BMC Res., Inc. v. Paymentech, L.P.*, 498 F.3d 1373, 1381 (Fed. Cir. 2007), *overruled on other grounds by Akamai Techs., Inc. v. Limelight Networks, Inc.*, No. 2009–1372, 2012 WL 3764695 (Fed. Cir. Aug. 31, 2012) (per curiam).

57. To be sure, it may seem unlikely that an ordinary citizen would ever need to worry about the enforceable scope of a patent on, say, laboratory equipment for conducting large-scale genomics or industrial tools used for oil drilling. By contrast, patents that cover a customer’s interaction with a commercial website might be pertinent to many of us.

patent. This complexity is due largely to the fact that a patent's exclusionary right is linked to something intangible, the idea of the invention disclosed in the patent document, rather than something physical, such as land for real property or an object for most personal property. Ascertaining the scope of the patent is crucial to both the owner of the patent and to competitors. The owner wants to ensure that her patent covers her goods in the market, and competitors need to assess their freedom to operate in a given market.

While patent scope is inextricably tied to the patent document itself, and particularly a patent's claims, the reality is that an assessment of a patent's right to exclude requires consideration of a rather complex amalgam of doctrines, rules, and canons. Courts initially assess the scope of a patent by engaging in claim construction, the process of providing definitions to disputed claim terms. In addition to claim construction, a patentee is entitled to protection against anything viewed as equivalent to the claimed invention. In fact, as a result of the doctrine of equivalents, the scope of a patent actually changes over time, ensnaring later-developed technologies that are nevertheless viewed as equivalent to the original invention.<sup>58</sup> In response to the uncertainty created by the doctrine of equivalents, the courts have created a litany of doctrines that limit the scope of equivalents. Beyond the construction of the claims themselves, there are various acts that constitute infringement, including making, using, selling, offering to sell, or importing the invention;<sup>59</sup> actively inducing others to infringe;<sup>60</sup> and contributing to the infringement of others.<sup>61</sup> Consequently, assessing patent scope is notoriously difficult, requiring familiari-

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58. See Cotropia, *supra* note 27, at 176; Holbrook, *supra* note 27, at 29–30. For these reasons, while we agree with many of the insights by Clarisa Long, we reject her notion that courts play little role in determining the bounds of the exclusive right of a patent. See Long, *supra* note 53, at 499–500 (“While a court may interpret the language of the patent after it has been issued, the nature of the judicial inquiry is not to fine-tune the scope of the patent (or indeed to adjust the scope of the patent after the fact), but to examine the validity of each claim.”). It seems to us that courts do adjust the scope of the patent after the fact, both indirectly through claim construction and quite directly under the doctrine of equivalents. We are not as sanguine as Long that resort to the patent document alone can resolve questions of scope: some facility with the case law governing claim construction, the doctrine of equivalents, and related doctrines is required.

59. 35 U.S.C. § 271(a) (2006).

60. *Id.* § 271(b).

61. *Id.* § 271(c).

ty not only with the disclosure of a given patent, but also with the various rules and doctrines that determine the extent of a patent's exclusive rights.

Commentators have suggested that the uncertainty surrounding the scope of patents and the attendant lack of public notice are perhaps the most significant problems with patent law.<sup>62</sup> Even though the courts, and the Federal Circuit in particular, have articulated a strong policy preference for certainty in order to effect adequate public notice,<sup>63</sup> uncertainty remains a key point of contention. Perhaps to its detriment, the Federal Circuit has focused the bulk of its efforts in this area on aggrandizing power over patent scope at the appellate level.<sup>64</sup> This development, however, has resulted in little doctrinal evolution, especially in the area of claim construction, as we detail below. Instead, the Federal Circuit has enforced what it views as correct claim constructions in an inscrutable fashion, pursuant to its *de novo* review of this issue.<sup>65</sup>

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62. See, e.g., JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE 46–52 (2008) (arguing that even sophisticated entities have been victims of the patent scope uncertainty and notice issues); Timothy R. Holbrook, *Patents, Presumptions, and Public Notice*, 86 IND. L.J. 779, 788 (2011).

63. See, e.g., *In re Katz Interactive Call Processing*, 639 F.3d 1303, 1315 (Fed. Cir. 2011); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1319 (Fed. Cir. 2005) (en banc) (rejecting use of extrinsic evidence as “undermining the public notice function of patents”); *PSC Computer Prods., Inc. v. Foxconn Int’l, Inc.*, 355 F.3d 1353, 1361 (Fed. Cir. 2004) (defining the “public notice” function as “the mechanism whereby the public learns which innovations are the subjects of the claimed invention, and which are in the public domain”); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359, 1369 (Fed. Cir. 2003) (en banc) (“[T]hat reason [for the narrowing amendment] should be discernible from the prosecution history record, if the public notice function of a patent and its prosecution history is to have significance.”); *Pioneer Magnetics, Inc. v. Micro Linear Corp.*, 330 F.3d 1352, 1356 (Fed. Cir. 2003) (refusing to consider extrinsic evidence to rebut *Warner-Jenkinson* presumption because “the public notice function of the patent record would be undermined”); *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1052 (Fed. Cir. 2002) (en banc) (“The claims give notice both to the examiner at the U.S. Patent and Trademark Office during prosecution, and to the public at large, including potential competitors, after the patent has issued.”).

64. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979–80 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).

65. See *Phillips*, 415 F.3d at 1319 (refusing to reconsider *de novo* review); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1455 (Fed. Cir. 1998) (en banc) (holding that claim construction is reviewed *de novo* on appeal). *But see* *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 659 F.3d 1369, 1370 (Fed. Cir. 2011) (Moore, J., dissenting from denial of petition for rehearing en banc); *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 469 F.3d 1039, 1040 (Fed. Cir. 2006) (en banc) (declining en banc reconsideration of *de novo* review with several dissents and concurrences).

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Largely lost in this doctrinal debate over claim construction and related infringement doctrines is the audience perspective. We know that claim scope doctrines such as claim construction strive to provide notice at an extraordinary level of precision to the “public,” but the court has not accounted for the fact that its claim scope rules are likely to be recoded and relayed among multiple actors before ever reaching the “public,” if by that terminology we mean the general public that is technically bound by those scope rules. That is, the court in its claim scope jurisprudence has insisted on rules of supreme complexity, directed through a complex network of intermediaries to a distant audience.

The result is a difficult proximity/complexity problem. The audience perspective is useful not only for identifying the problem, but also for evaluating efforts to resolve it. Our discussions of individual scope doctrines in this section focus primarily on judicial efforts to create standards such as the PHOSITA or the “reasonable competitor” to frame certain claim scope inquiries. We can reconceptualize these standards as efforts to construct an audience that is more proximate to the rulemaking institution, and then offer some judgments about whether they have succeeded.

#### 1. Claim Construction: The PHOSITA as a Constructed Audience

The set of rules most directly concerned with patent scope is, of course, the claim construction rules, collectively the primary mechanism by which courts elaborate the appropriate scope of the patent. Claim construction is central to nearly all aspects of patent law because it is relevant both in asserting whether a patent claim is invalid and whether it is infringed.<sup>66</sup> As such, the claims and the accompanying set of legal rules for construing them are considered central to affording proper public notice in the patent system.

No area of patent law has been the target of more criticism than the Federal Circuit’s claim construction jurisprudence. An entire cottage industry of empirical and theoretical studies of

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66. See *Retractable*, 659 F.3d at 1370 (Moore, J., dissenting from denial of petition for rehearing en banc) (“Claim construction is the single most important event in the course of a patent litigation. It defines the scope of the property right being enforced, and is often the difference between infringement and non-infringement, or validity and invalidity.”).

claim construction<sup>67</sup> has developed in the years since the Supreme Court's seminal decision in *Markman v. Westview Instruments Inc.*<sup>68</sup> The consistent theme among critics is that claim construction outcomes are too unpredictable. The Federal Circuit's current practice of undertaking plenary review of claim construction on appeal has generated a regime of complex legal rules, and some would say that there has been little or no offsetting advancement of the notice function.<sup>69</sup>

For our purposes, a glimpse at some of the Federal Circuit's claim construction rules suffices to illustrate their complexity. The Federal Circuit has adopted the rule that, in order to construe a claim, a court must first look to the evidence in the public record regarding the patent: the claims of the patent, the specification of the patent, and the record of the application at the USPTO, known as the prosecution history.<sup>70</sup> This subset of evidence has been called the intrinsic evidence.<sup>71</sup> Any other evidence, such as treatises, dictionaries, expert testimony, or inventor testimony, is deemed to be extrinsic evidence.<sup>72</sup> A companion rule of claim construction permits a court to consult extrinsic evidence to educate itself, but forbids the court from using that evidence to contradict the intrinsic evidence if the

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67. See generally, e.g., Mark A. Lemley, *The Changing Meaning of Patent Claim Terms*, 104 MICH. L. REV. 101 (2005); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1 (2001); Kimberly A. Moore, *Markman Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231 (2005); Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365 (2000); Craig Allen Nard, *A Theory of Claim Interpretation*, 14 HARV. J.L. & TECH. 1 (2000); David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223 (2008); Harry Surden, *Efficient Uncertainty in Patent Interpretation*, 68 WASH. & LEE L. REV. 1737 (2011); R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105 (2004).

68. 517 U.S. 370 (1996).

69. See *Retractable*, 659 F.3d at 1370 (Moore, J., dissenting from denial of petition for rehearing en banc) (characterizing the claim construction rules as “ill-defined and inconsistently applied, even by us,” and suggesting that the rules have led to “frustrating and unpredictable results for both the litigants and the trial court”).

70. See, e.g., *Phillips*, 415 F.3d at 1314.

71. *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

72. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

intrinsic evidence is unambiguous.<sup>73</sup> Additional rules build on this framework. For example, one rule provides that a claim is to be given its “ordinary meaning” unless the patentee offers a unique definition, either explicitly in the specification or implicitly by disavowing subject matter in the specification or the prosecution history.<sup>74</sup> Another rule attempts to mediate between forms of intrinsic evidence, prohibiting a court from importing limitations into the claim from the specification or the prosecution history.<sup>75</sup> In addition to these basic precepts, courts may invoke a multitude of other canons of claim construction.<sup>76</sup>

Under the framework proposed in this Article, the sheer complexity of these claim construction rules is not necessarily problematic by itself. However, rule complexity becomes problematic when proximity is also unfavorable, because it produces the “Quadrant IV” problem that we have previously discussed. And claim construction rules present a massive proximity problem, because those rules are purportedly directed to the “public,” to whom the rules are to provide “notice.” This is a monumental aspiration. Claims are verbal recitations that are all but meaningless to the “public,” if by that we mean the general public. Sitting by designation at the district court level, Judge Posner offered this trenchant critique of the litigants’ proposed claim constructions:

[M]any of the proposed claims constructions are not in language intelligible to jurors . . . . There is no point in giving jurors stuff they won’t understand. The jury (actually juries) will not consist of patent lawyers and computer scientists or engineers unless the parties stipulate to a “blue ribbon” jury; I would welcome their doing so but am not optimistic.<sup>77</sup>

Moreover, to say that claims give meaningful notice to the public is to say that the public not only has a mechanism for discovering the existence of particular claims, but also has the ca-

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73. *Phillips*, 415 F.3d at 1318–19. *But see* Holbrook, *supra* note 62, at 819 (arguing that the most appropriate time to consult extrinsic evidence is when it conflicts with the intrinsic evidence).

74. *Phillips*, 415 F.3d at 1319 (discussing the standard applied by the court in *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002)).

75. *Id.* at 1320.

76. See Timothy R. Holbrook, *Substantive Versus Process-Based Formalism in Claim Construction*, 9 LEWIS & CLARK L. REV. 123, 144–46 (2005) (cataloging the various canons and presumptions in construing a claim).

77. *Apple Inc. v. Motorola, Inc.*, No. 1:11-CV-08540 (N.D. Ill. Mar. 10, 2012) (Posner, J., sitting by designation) (order regarding claim construction briefs).

capacity to comprehend and apply the legal rules of construction needed to decode those claims.<sup>78</sup>

This is a useful insight. The audience perspective provides a reminder that reforming the law of claim construction need not, and probably should not, be exclusively about attempts to combat complexity in claim construction rules. Instead, it should be about achieving a more favorable proximity/complexity tradeoff. One way to do that is to develop simplifying heuristics that bridge the distance between the rule-promulgating institution and the audience. Essentially, the goal is to make apparent proximity more favorable while tolerating a certain level of complexity.

It might be argued that the Federal Circuit is already following just such a strategy. Claims are said to be directed to the hypothetical PHOSITA.<sup>79</sup> Framed in terms of the audience analysis, the PHOSITA may be understood as a legal construct that bridges the distance between the formal rules of claim construction and the ultimate general public audience. That is, the PHOSITA might be visualized as a node on the network diagram of the modern patent system shown in the preceding section, albeit a hypothetical and amorphous one.

The analytic move to conjure up a PHOSITA heuristic coincides with the types of methodologies that our audience analysis advocates. But we have many reservations about the Federal Circuit's deployment of the PHOSITA heuristic in the context of claim construction. First, our analysis contemplates that a heuristic such as the PHOSITA will be used instrumentally to solve a serious proximity problem—not merely recited by rote as a default objective standard. To work well in the context of our analysis, the PHOSITA construct would need to be given real content, contextualized on a case-by-case basis.<sup>80</sup>

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78. Real property boundaries may present analogous problems, but they are likely to be far less severe. Real property boundaries may be demarcated by physical barriers or other indicia that instantly convey a claim of exclusivity to the public, and even where they are not, social norms may serve as a reliable substitute.

79. See *Phillips*, 415 F.3d at 1313 (“We have made clear, moreover, that the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention . . .”).

80. For discussions about the PHOSITA construct and ways of improving it, see Jonathan J. Darrow, *The Neglected Dimension of Patent Law's PHOSITA Standard*, 23 HARV. J.L. & TECH. 227 (2009); Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885 (2004); Joseph P. Meara, *Just Who Is the Person*

Elaborating the qualities of the PHOSITA would need to be a central element of a claim construction analysis, rather than a throw-off point. We see little of that in the existing case law. Instead, the Federal Circuit frequently seems to ascribe little value to the perspective of the PHOSITA in claim construction.<sup>81</sup>

Second, the case law causes us to question whether the PHOSITA construct is sufficiently durable for improving proximity in the law of claim construction. The Federal Circuit relies on the PHOSITA construct most heavily (at least in claim construction) when invoking its “customary and ordinary meaning” rule: that is, the court will seek to determine the customary and ordinary meaning of the claim language *as perceived by the PHOSITA*.<sup>82</sup> But the Federal Circuit has carved out a key exception—patent applicants are free to be their own lexicographers, affording unique definitions to the terms in the claims.<sup>83</sup> The exception can be triggered in either of two ways: when the patentee acts as her own lexicographer and offers an express definition of a term, or when the patentee unmistakably disavows subject matter through narrowing language and arguments in the specification or prosecution history.<sup>84</sup> Effectively, the proposition here is that a PHOSITA knows that under these two special circumstances, the patentee’s language in the specification or the prosecution history trumps the customary meaning.

This is a great deal to ask of a heuristic device, as is evident from claim construction cases that focus on implicit “disavowal” or other closely-related cases that debate the propriety of reading language from the specification or prosecution history into the claims. These latter cases in particular have recently demonstrated the fragility of the Federal Circuit’s current approach to the process of claim construction. In *Retractable Technologies, Inc. v. Becton, Dickinson & Co.*, the majority lim-

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*Having Ordinary Skill in the Art? Patent Law’s Mysterious Personage*, 77 WASH. L. REV. 267 (2002); John O. Tresansky, *PHOSITA—The Ubiquitous and Enigmatic Person in Patent Law*, 73 J. PAT. & TRADEMARK OFF. SOC’Y 37, 37–38 (1991).

81 See generally Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1185–202 (2002) (discussing flexibility and misapplication of the PHOSITA construct by the courts).

82. *Phillips*, 415 F.3d at 1313.

83. *Id.* at 1316.

84. See *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012).

ited the claim term “body” to having only one piece, excluding a multiple-piece structure.<sup>85</sup> Writing for the majority, Judge Alan D. Lourie suggested the goal for claim construction is “to capture the scope of the actual invention, rather than strictly limit the scope of claims to disclosed embodiments or allow the claim language to become divorced from what the specification conveys is the invention.”<sup>86</sup> Dissenting, Chief Judge Randall R. Rader noted that the claim language should be given primacy and, as that language was silent as to the number of pieces, it should be read to cover a multi-bodied device.<sup>87</sup> The Federal Circuit declined to rehear the case en banc, but Judge Kimberly A. Moore offered a forceful dissent, recognizing the split in the court about the appropriate role of the specification in interpreting patent claims.<sup>88</sup> It is not clear to us that resort even to a better-elaborated PHOSITA would resolve this split. An engineer or scientist could offer little insight into this linguistic colloquy of whether the specification narrowed the legal scope of the claim, rendering resort to a fully-fleshed PHOSITA unhelpful. The use of the specification in an estoppel-like surrender derives from legal line drawing and analysis, not from the

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85. 653 F.3d 1296, 1305 (Fed. Cir. 2011).

86. *Id.* Judge Lourie previously advocated such a role for the specification in *Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 632 F.3d 1246, 1257–58 (Fed. Cir. 2011) (Lourie, J., concurring in part and dissenting in part) (“The bottom line of claim construction should be that the claims should not mean more than what the specification indicates, in one way or another, the inventors invented.”).

87. *Retractable*, 653 F.3d at 1312.

88. *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 659 F.3d 1369, 1373 (Fed. Cir. 2011) (Moore, J., dissenting from denial of petition for rehearing en banc) (“*Retractable* illustrates a fundamental split within the court as to the meaning of *Phillips* and *Markman* as well as the proper approach to claim interpretation. I would grant en banc review of *Retractable* to resolve the clear intra-circuit split on the claim construction process.”). Judge Plager recently attempted to reconcile these seemingly diverging views, noting that they are “complementary,” not antithetical. *MySpace, Inc. v. Graphon Corp.*, 672 F.3d 1250, 1256 (Fed. Cir. 2012) (“[I]t is an over-simplification to suggest that these are competing theories; rather, they are complementary.”). Judge Moore, along with Judge O’Malley, would also revisit the current de novo standard of review for claim construction. *Retractable*, 659 F.3d at 1373 (Moore, J., dissenting) (“I would also grant en banc review in *Retractable* to consider whether deference should be given to the district court’s claim construction.”); *id.* at 1374 (O’Malley, J., dissenting from denial of petition for rehearing en banc) (“It is time to revisit and reverse our decision in *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998) (en banc).”). The Supreme Court, as of this writing, has asked for the Solicitor General’s views on the case. *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, No. 11-1154, 2012 WL 2470092 (U.S. June 29, 2012).

technical aspects of the invention.<sup>89</sup> No matter how fleshed out the PHOSITA is, her views as a technologist simply will not inform what is essentially a legal analysis.

Third, the claim construction cases illustrate how truly hypothetical the PHOSITA is. Real inventors generally do not concern themselves with language of surrender and disavowal; these linguistic gymnastics are more in the nature of legal argumentation than a scientifically-driven assessment of the patent's disclosure.<sup>90</sup> In addition to the examples already cited, one might consider the manner in which the Federal Circuit uses the prosecution history to inform claim construction. The prosecution disclaimer doctrine<sup>91</sup> uses the patentee's representations at the USPTO against her to narrow the literal scope of the claim. The justification for this policy is to "promote[] the public notice function of the intrinsic evidence and protect[] the public's reliance on definitive statements made during prosecution."<sup>92</sup> This presents the same sort of proximity problem that we have been discussing, but it is not clear to us that merely invoking the PHOSITA in place of the general public, and asserting that it is the PHOSITA who would be parsing the prosecution record for disclaimers, is a defensible way forward. After all, the court is considering the *legal* consequence of representations made during the prosecution process. The immediate audience for such an assessment is the audience of patent law sophisticates. It seems to us a stretch to hypothesize a PHOSITA that is both conversant in such an assessment and is simultaneously a reasonable surrogate for the general public audience.

All of this may boil down to the conclusion that, while we need a bridging heuristic for claim construction to deal with the proximity problem, the PHOSITA heuristic in its current incarnation may not be up to the task. John Golden has arrived at a similar conclusion. Golden suggests that claims be inter-

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89. See Holbrook, *supra* note 76, at 139–44 (discussing the evolution of estoppel-like uses of the specification).

90. See Holbrook, *supra* note 62, at 791.

91. See *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003). For a summary of the evolution of this rule from cases dealing with equivalency under 35 U.S.C. section 112, paragraph 6, to a rule of general applicability, see Holbrook, *supra* note 76, at 134–39.

92. *Omega*, 334 F.3d at 1324. For a critique on the use of prosecution histories to assess patent scope, see John R. Thomas, *On Preparatory Texts and Proprietary Technologies: The Place of Prosecution Histories in Patent Claim Interpretation*, 47 UCLA L. REV. 183, 200–16 (1999).

preted from the perspective of the “interpretive community,” which he defines as “the community of people for whom understanding patent claims is an important and regular enterprise.”<sup>93</sup> That is, in his view, the claims’ “primary audience is united more by commercial interest and legal duty than by technological expertise. A mixture of businesspersons, lawyers, USPTO examiners, and judges, this audience consists largely of individuals who lack an artisan’s skill in the relevant technological art.”<sup>94</sup> Such community members have a realistic exposure to infringement liability or general interest in avoiding infringement liability.<sup>95</sup> And, of course, these actors, in contrast to the general public, are likely to be more proximate to the courts. Thus, the audience analysis that we are advocating here places Golden’s suggestion in a broader theoretical frame. His suggestion can be understood as a design strategy reflecting another set of normative choices about the relevant audience and the best way to deal with the complexity/proximity tradeoff.

In sum, reassessing the claim construction process in terms of the framework advocated here persuades us that, at a minimum, the Federal Circuit must dispense with the conceit that claim construction doctrine effectuates precise notice to the general public. The PHOSITA construct potentially could be a helpful intermediary between the court and the general public, but at present it remains too underdeveloped to effect that objective. In the interim, it would be better for the court to admit that its claim construction rules are for a limited group of sophisticates. The Golden methodology provides a laudable step in this direction by recognizing that the members of the “interpretive community” are those that have some facility both with the relevant technology of a patent and with the doctrines dealing with claim construction. These actors then can translate these rules and constructions to the lay audience, their clients. We believe, however, that there are open questions about the extent to which that limited group can successfully convey the legal rules and their consequences to the general public or even to their immediate audience of business interests.

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93. John M. Golden, *Construing Patent Claims According to Their “Interpretive Community”: A Call for an Attorney-Plus-Artisan Perspective*, 21 HARV. J.L. & TECH. 321, 331 (2008).

94. *Id.* at 334.

95. Clarisa Long has dubbed such persons “avoiders”—they have no interest in the actual invention or patent but merely want to avoid infringing it. Long, *supra* note 53, at 491.

## 2. Prosecution History Estoppel: The Appearance (and Disappearance) of the “Reasonable Competitor” as Audience

Patents cover not only what they literally claim but also devices or processes that are equivalent to the claimed invention. The determination of what is “close enough” to be an equivalent is a highly fact-intensive inquiry that is not a “prisoner to formula.”<sup>96</sup> The policy underlying the doctrine is to avoid strict literalism that would permit others to avoid the patent easily by making trivial changes to the device.<sup>97</sup> The doctrine of equivalents therefore avoids potential arbitrage of a patent that a strictly literalist approach could encourage, and also prevents potential, inappropriate obsolescence of the claimed invention.<sup>98</sup> Because equivalency can create fuzziness around the boundaries of a patent, the courts have offered a variety of doctrines designed to enhance certainty and predictability regarding the doctrine of equivalents. The doctrine of prosecution history estoppel is perhaps the premier limit.<sup>99</sup>

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96. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950). The courts have articulated at least three tests to assess whether elements in an accused device are equivalent. For example, the Federal Circuit has used the function-way-result test, which requires that the element in the accused device “performs substantially the same function in substantially the same way to obtain the same result” to be equivalent. *Am. Calcar, Inc. v. Honda Motor Co.*, 651 F.3d 1318, 1338 (Fed. Cir. 2011). The Federal Circuit has also offered the “insubstantial differences” test. *See Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1357 (Fed. Cir. 2004). *But see Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997) (“[T]he insubstantial differences test offers little additional guidance as to what might render any given difference ‘insubstantial.’”). Finally, courts have also considered whether the asserted equivalent was known to be interchangeable with the relevant claim limitation. *See Graver Tank*, 339 U.S. at 609 (“An important factor [in determining equivalents] is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was.”).

97. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731–32 (2002) (“If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. For this reason, the clearest rule of patent interpretation, literalism, may conserve judicial resources but is not necessarily the most efficient rule.”); *Graver Tank*, 339 U.S. at 607 (“[T]o permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing.”).

98. *See Cotropia*, *supra* note 27, at 174.

99. *See Festo*, 535 U.S. at 734 (“Prosecution history estoppel ensures that the doctrine of equivalents remains tied to its underlying purpose.”).

The basic idea behind prosecution history estoppel is that a patent owner should not be allowed to reclaim through the doctrine of equivalents subject matter that she gave up during the prosecution of the patent.<sup>100</sup> For example, consider a claim to a process that originally contains no limitation as to the pH range at which the process runs. If the claim is then amended to require that the process be run at a pH of 6.0–9.0, then the literal scope of the claim would no longer encompass a process running at a pH of 5.0. The patentee would be expected to argue that a pH of 5.0 is equivalent to a pH of 6.0–9.0 in the context of the claimed process, and the alleged infringer would be expected to counter by invoking the doctrine of prosecution history estoppel, arguing that the patentee should be estopped from making an assertion of equivalency on the grounds that the patentee is merely attempting to recapture subject matter that was surrendered during prosecution.<sup>101</sup> The estoppel argument would presumptively prevail on these facts, but the presumption of estoppel is rebuttable, according to the framework established in the Supreme Court's *Festo* decision and elaborated in many Federal Circuit decisions since then.<sup>102</sup> A patentee may yet avail herself of the doctrine of equivalents if the narrowing claim amendment giving rise to the alleged surrender bore only a tangential relationship to the asserted equivalent, or if the asserted equivalent was unforeseeable at the time of the amendment.<sup>103</sup> In turn, additional rules regulate the types of evidence that may be used to support these respective rebuttal arguments.<sup>104</sup> As a whole, the post-*Festo* law of prosecution history estoppel depends upon a multi-level regime of legal rules rather than broadly-demarcated zones of equita-

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100. See, e.g., *Merck & Co. v. Mylan Pharms., Inc.*, 190 F.3d 1335, 1341–42 (Fed. Cir. 1999) (holding that an amendment limiting the claim to two specific polymers resulted in estoppel as to other polymers in the “water soluble” group, which the accused device used).

101. This example mirrors the situation in *Warner-Jenkinson*, 520 U.S. at 21–23.

102. *Festo*, 535 U.S. at 741; see, e.g., *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1379–80 (Fed. Cir. 2003) (explaining that the presumption of estoppel is rebuttable in this “post-*Festo* era”).

103. *Festo*, 535 U.S. at 740–41. The rationale for permitting rebuttal in these circumstances is that one cannot say that the patentee genuinely surrendered the asserted equivalent. As to the former, the patentee presumably did not contemplate the equivalent when amending the claim; as to the latter, the patentee could not have volitionally surrendered the equivalent because it did not yet exist. The Court has also left open the possibility that “other reasons” could serve as a basis for rebuttal. *Id.*

104. See *supra* notes 70–76 and accompanying text.

ble discretion. It is probably fair to say that prosecution history estoppel now has a greater degree of rule complexity. There is no question that it is more rule-bound.

Accordingly, it would be useful to consider how (or if) prosecution history estoppel's new rule complexity trades off against its proximity. Unfortunately, the court's jurisprudence gives little indication that the court has developed any coherent notion of the appropriate audience for prosecution history estoppel rules, much less any deliberate calculation about proximity.

Some of the older, pre-*Festo* Federal Circuit prosecution history estoppel decisions displayed at least some marginal sensitivity to the question of audience. In these cases, the Federal Circuit held that whether prosecution history estoppel applies is determined from the perspective of the "reasonable competitor."<sup>105</sup> In our framework, this apparent departure from the default PHOSITA heuristic is significant: it could signal a determination that statements in a prosecution history, and the rules that specify whether those statements will negate equivalents, are designed for a (hypothetical) audience that is more expert and more proximate than the PHOSITA. Or, to reframe the argument in normative terms, the adoption of a reasonable competitor standard might result from an instrumental determination that prosecution history estoppel rules ought to be designed to speak to an expert audience, but need not attempt to put the general public on notice.

However, the court's rhetoric around the reasonable competitor standard in prosecution history estoppel cases has not evidenced this sort of deliberation. Instead, the court has expended more effort apologizing for the reasonable competitor standard than it has spent explaining it. In *Hoganas AB v. Dresser Industries, Inc.*, the court muddied any distinctions between the PHOSITA and the reasonable competitor:

Ordinarily, the test for determining the meaning of a claim term is from the vantage point of one skilled in the art. This test would seem equally appropriate for determining what subject matter was relinquished in the context of prosecution history estoppel. Our precedent dealing with this specific question recites that the test is measured from the vantage point of a reasonable competitor. We do not see the-

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105. See, e.g., *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 813 (Fed. Cir. 2002) ("The relevant inquiry is whether a competitor would reasonably believe that the applicant had surrendered the relevant subject matter."); *Cybor Corp. v. FAS Techs.*, 138 F.3d 1448, 1457 (Fed. Cir. 1998) (en banc) (same); see also *Golden*, *supra* note 93, at 371.

se formulations as necessarily inconsistent—the point is the knowledge of one reasonably skilled in the art who views the question from the perspective of a competitor in the marketplace.<sup>106</sup>

Similarly, the court in *Pharmacia & Upjohn Co. v. Mylan Pharmaceuticals, Inc.* noted “[i]t is, after all, a competitor who is desirous of ascertaining the scope of the claims, but it is one skilled in the art who is best able to understand them. Nonetheless, the standard is the reasonable competitor standard . . . .”<sup>107</sup>

The court’s ambivalent embrace of the reasonable competitor pre-*Festo* has not set the stage for an enhanced commitment after *Festo*. Instead, the reasonable competitor rhetoric has virtually disappeared.<sup>108</sup> This is especially problematic because the course of prosecution history estoppel law has made delineation of the audience all the more relevant.

We see this most clearly in the fine-grained rules that have developed around two of the rebuttal arguments—the “tangential relationship” argument and the “unforeseeability” argument. The “tangential relationship” requires a legal assessment of what was the prior art, how did the amendment distinguish the prior art, and whether the accused device relates to that basis for distinguishing the prior art.<sup>109</sup> The Federal Circuit has ruled that this inquiry is limited to consideration of the intrinsic evidence alone; resort to extrinsic evidence such as expert testimony is not permitted.<sup>110</sup> As the Federal Circuit explained, the “reason should be discernible from the prosecution history record, if the public notice function of a patent and its prosecution history is to have significance.”<sup>111</sup> Given that only intrinsic, publicly available information is relevant to the inquiry, the Federal Circuit has noted that the “tangential relationship” re-

106. 9 F.3d 948, 952 n.15 (Fed. Cir. 1993) (citations omitted).

107. 170 F.3d 1373, 1377 n.2 (Fed. Cir. 1999).

108. A search on Westlaw for the term “reasonable competitor” post-*Festo* yielded only one result, and the term “reasonable competitor” was not used in the body of the opinion but instead in a parenthetical quotation from a previous case. See *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 651 F.3d 1318, 1340–41 (Fed. Cir. 2011) (quoting *Sextant Avionique, S.A. v. Analog Devices, Inc.*, 172 F.3d 817, 826–27 (Fed. Cir. 1999)).

109. See, e.g., *Regents of Univ. of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1378 (Fed. Cir. 2008); *Primos, Inc. v. Hunter's Specialties, Inc.*, 451 F.3d 841, 849 (Fed. Cir. 2006); *Biagro W. Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1306 (Fed. Cir. 2005); *Insituform Techs., Inc. v. CAT Contracting, Inc.*, 385 F.3d 1360, 1370–71 (Fed. Cir. 2004).

110. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359, 1369 (Fed. Cir. 2003) (en banc).

111. *Id.*

buttal is purely legal and reviewed de novo on appeal.<sup>112</sup> This exploration of the reasons for the amendment and its relationship to the asserted equivalent is not technologically driven; instead, it amounts to a legal conclusion as to whether claim scope should be precluded. Notwithstanding the reference to the “public” notice function, these rules belong almost exclusively to the domain of lawyers; they speak predominantly to patent sophisticates, and only provide notice to the general public indirectly, at best. In the terminology that we are using, we can probably assume favorable (close) proximity, and therefore we can tolerate relatively high rule complexity. Consistent with this position, the court might adopt an appropriate heuristic (the reasonable patent lawyer? the reasonable competitor?).<sup>113</sup>

Unfortunately, the same analysis is not likely to apply to the “unforeseeability” rebuttal argument. The question of whether an asserted equivalent was unforeseeable at the time of the amendment is rooted in a factual, technological inquiry. The Federal Circuit has held that it is appropriate, and likely necessary, to consider extrinsic evidence in this context and that, because fact-finding will be involved, the court may need to defer to those findings on appeal.<sup>114</sup> The court reasoned:

By its very nature, objective unforeseeability depends on underlying factual issues relating to, for example, the state of the art and the understanding of a hypothetical person of ordinary skill in the art at the

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112. *See id.* at 1370.

113. Argument-based prosecution history estoppel may be subject to a similar analysis. Prosecution history estoppel is not limited to situations in which the applicant amends the claim. It can also arise when, through arguments made to the USPTO, the patent applicant unmistakably disclaims claim scope. This argument-based estoppel operates identically to the prosecution disclaimer rule used in claim construction but, instead of limiting the literal scope of the claim, it limits the range of equivalents available under the doctrine of equivalents. *See Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1326 n.1 (Fed. Cir. 2003) (“We note that [the prosecution disclaimer standard] is the same standard applicable, in the context of the doctrine of equivalents, to the doctrine of argument-based estoppel and that our precedent has recognized a relation between the doctrines of argument-based estoppel and prosecution disclaimer.”). The doctrines are so similar that in no case has the Federal Circuit found the disclaimer to apply in claim construction but then concluded that argument-based prosecution history estoppel did not apply. The court itself has recognized that the standards are the same. *Id.* The idea of “surrender” in this context is directed to the legal consequences of arguments made in front of the USPTO, not technically-based historical facts. Argument-based estoppel therefore operates in a manner akin to the “tangential relationship” rebuttal of amendment-based prosecution history estoppel.

114. *See Festo*, 344 F.3d at 1369.

time of the amendment. Therefore, in determining whether an alleged equivalent would have been unforeseeable, a district court may hear expert testimony and consider other extrinsic evidence relating to the relevant factual inquiries.<sup>115</sup>

Indeed, the “unforeseeability” rebuttal argument seems to rest on the premise that the prosecution history will convey some message directly to a technologist, who will call upon his or her expertise to render an essentially technical judgment about foreseeability and pattern his or her behavior accordingly.<sup>116</sup> If this is so, then the court’s jurisprudence must account for this more distant audience by reducing the complexity of the pertinent rules or by invoking robust heuristics that make the apparent proximity more favorable.

Perhaps the dilemma that we have described is simple enough to resolve: the court can simply adopt different heuristics for the different rebuttal arguments, explicitly recognizing that the rules are designed for consumption by different audiences.<sup>117</sup> That would be a worthwhile interim improvement, but we think it highlights a deeper problem with the design of the prosecution history estoppel doctrine. Doctrines that are based on more familiar forms of equitable estoppel usually require a showing of reliance, and generally have arrived at a clear consensus about who the putative reliant party is.<sup>118</sup> Other forms

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115. *Id.*

116. Arguably the Federal Circuit has larded this essentially technological judgment with yet more complex legal rules as to foreseeability: an equivalent is foreseeable if it existed at the time of the application *even if no one would have recognized* the work as of the date of the application. If the rationale for the “foreseeability” approach is that the patentee could have, and should have, filed an application that covers foreseeable equivalents, then this test undermines that policy objective because, absent such knowledge, the patentee would not have been able to claim the asserted equivalent because she would not be able to provide an enabling disclosure. *See* Holbrook, *supra* note 27, at 23–26 (criticizing the Federal Circuit’s foreseeability analysis).

117. We portray this as simple, but in fact, the court has done virtually nothing to date to give content to the heuristics that it has (occasionally) invoked. This problem has been especially acute with regards to the “reasonable competitor.” At a minimum, it seems that the hypothetical reasonable competitor has some facility with patent law. The court explained that “[t]he determination of whether an amendment was made for purposes of patentability on grounds of obviousness is adjudged from the viewpoint of a person of skill in the field of the invention, and when the issue includes consideration of formalities of patent practice, experience in patent law and procedures is presumed.” *Merck & Co. v. Mylan Pharm., Inc.*, 190 F.3d 1335, 1340 (Fed. Cir. 1999).

118. *See, e.g.*, *City of Clinton, Ark. v. Pilgrim's Pride Corp.*, 632 F.3d 148, 155 (5th Cir. 2010) (promissory estoppel requires detrimental reliance); *Goodenberger v. Ellis*, 343 S.W.3d 536, 541 (Tex. App. 2011) (easement by estoppel requires reliance).

of estoppel—such as judicial estoppel—may not expressly require reliance, but may presume it away in the interest of preserving the integrity of the tribunal.<sup>119</sup> There are arguments that would map prosecution history estoppel to these traditional forms of estoppel,<sup>120</sup> but they all make assumptions about audience. We could say that the general public presumptively relies on any statement that an applicant makes during prosecution,<sup>121</sup> or we could say that, as in judicial estoppel, the examiner is presumed to have relied on any such statement. Unfortunately, the court has not engaged in this discussion about prosecution history estoppel. We suspect that prosecution history estoppel jurisprudence will remain conceptually thin until that discussion proceeds.

### 3. Disclosure-Dedication Rule and Other Specification-Based Doctrines of Surrender

The public dedication rule is another patent scope doctrine that might benefit from closer scrutiny of the complexity/proximity tradeoff. Under the disclosure-dedication rule, anything disclosed in the patent specification that is not claimed is per se dedicated to the public, and the patent owner cannot use the doctrine of equivalents to recapture protection of that subject matter.<sup>122</sup> In *Johnson & Johnston Associates v. R.E.*

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119. That is, in some instances, it will be presumed that any misrepresentation made before a tribunal will be relied upon by the tribunal. *See, e.g., Monterey Dev. Corp. v. Lawyer's Title Ins. Corp.*, 4 F.3d 605, 609 (8th Cir. 1993) (“Because the doctrine's focus is on the court's integrity, judicial estoppel does not require proof of privity, reliance, or prejudice by the party invoking it.”); *cf. New Hampshire v. Maine*, 532 U.S. 742, 750–51 (2001) (judicial estoppel requires court to accept party's earlier position (i.e., rely upon it)).

120. Or, we could conclude that prosecution history estoppel is not “estoppel” at all. *See Thomas, supra* note 92, at 202 (“[E]ven a cursory examination reveals that the doctrine of prosecution history estoppel is entirely misnamed. An essential element of estoppel is reliance, a consideration that is wholly absent in the reported patent decisions.”).

121. For hints of this attitude, see *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 221 (1940) (“The injurious consequences to the public and to inventors and patent applicants if patentees were thus permitted to revive cancelled or rejected claims and restore them to their patents are manifest.”); *Leggett v. Avery*, 101 U.S. 256, 259–60 (1879) (noting “occasion of immense frauds against the public” when formerly abandoned claims are revived).

122. *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1054 (Fed. Cir. 2002) (en banc). For a general discussion of the use of the specification to limit equivalents, see *Holbrook, supra* note 76, at 139–44. The Federal Circuit has also used the specification to narrow the availability of the doctrine of equivalents in circumstances that do not directly involve a disclosure-dedication issue, but may involve, for example, a specification that disparages

*Service Co.*, which involved printed circuit boards, the specification stated that “[w]hile aluminum is currently the preferred material for the substrate, other metals, such as stainless steel or nickel alloys may be used.”<sup>123</sup> However, the claims expressly called for “a sheet of aluminum.”<sup>124</sup> This was a clear instance of disclosing subject matter (alternatives to aluminum) without claiming it, according to the Federal Circuit.<sup>125</sup> By looking to the claim to define the scope of the right to exclude, and by treating the disclosed but unclaimed subject matter as having been dedicated to the public, the court asserted that it was upholding the public notice function of claims.<sup>126</sup> Elaborating on the meaning of the public notice function, the court declared that the claims “give notice both to the examiner at the U.S. Patent and Trademark Office during prosecution, and to the public at large, including potential competitors, after the patent has issued.”<sup>127</sup>

It would seem easy enough to apply a complexity/proximity calculus to the disclosure-dedication rule as enunciated in *Johnson & Johnston*: this is a simple rule that therefore can reasonably be directed to a diffuse and distant audience. But this assessment is surely incorrect. The disclosure-dedication rule is terrifically complex in application. To elicit what has

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or otherwise surrenders an asserted equivalent. *See, e.g.*, *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1339 (Fed. Cir. 2001); *Vehicular Techs. Corp. v. Titan Wheel Int’l, Inc.*, 212 F.3d 1377, 1380–81 (Fed. Cir. 2000) (failure to perform unclaimed but disclosed “back-up function” precludes equivalency). The application of these narrowing strategies in the context of equivalents seems correlated to the court’s conclusions about how to construe a particular claim. Generally, when the court narrows the literal scope of the claims pursuant to the specification in the course of claim construction, the court also will find that the patentee is precluded from using the doctrine of equivalents. *See, e.g.*, *L.B. Plastics, Inc. v. Amerimax Home Prods., Inc.*, 499 F.3d 1303, 1309 (Fed. Cir. 2007) (“We have held that when a specification excludes certain prior art alternatives from the literal scope of the claims and criticizes those prior art alternatives, the patentee cannot then use the doctrine of equivalents to capture those alternatives.”). *But see* *Holbrook*, *supra* note 62, at 806 n.169 (criticizing this per se preclusion of the doctrine of equivalents). The one exception to this rule has been when the asserted equivalent was unforeseeable at the time of the application. *See* *Abraxis Bioscience, Inc. v. Mayne Pharma (USA) Inc.*, 467 F.3d 1370, 1376–78 (Fed. Cir. 2006); *see also* *Holbrook*, *supra* note 27, at 26–27 (discussing the implications of *Abraxis*).

123. 285 F.3d at 1055.

124. *Id.*

125. *Id.*

126. *Id.* at 1052.

127. *Id.*

been dedicated, one must be able to determine what is claimed, what is disclosed, and how the two correlate. As we have already discussed,<sup>128</sup> claim construction alone is a formidable task, implicating proximity concerns, and the rules for determining what is disclosed in a patent specification are even more complex.<sup>129</sup>

The Federal Circuit's case law applying the disclosure-dedication rule hints at these struggles. In *PSC Computer Products, Inc. v. Foxconn International, Inc.*,<sup>130</sup> the claim at issue recited "an elongated, resilient metal strap," one element in a claimed retainer clip for a heat sink assembly used in making semiconductors.<sup>131</sup> The disclosure stated that "other resilient materials may be suitable for the strap," and it also stated that "[o]ther prior art devices used molded plastic and/or metal parts that must be cast or forged which again are more expensive metal forming operations."<sup>132</sup> The disclosure-dedication issue was whether these statements dedicated the alternative use of plastic parts to the public—or whether, indeed, they dedicated to the public *everything* except the use of "resilient metal."<sup>133</sup>

The court reverted to the PHOSITA heuristic in reformulating the disclosure-dedication rule:

We . . . hold that if one of ordinary skill in the art can understand the unclaimed disclosed teaching upon reading the written description, the alternative matter disclosed has been dedicated to the public. This "disclosure-dedication" rule does not mean that any generic reference in a written specification necessarily dedicates all members of that particular genus to the public. The disclosure must be of such specificity that one of ordinary skill in the art could identify the subject matter that had been disclosed and not claimed.<sup>134</sup>

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128. See *supra* Part III.A.1 (regarding claim construction and the PHOSITA as a constructed audience).

129. See *infra* Part III.A.4 (discussing disclosure doctrines from an audience perspective).

130. 355 F.3d 1353 (Fed. Cir. 2004).

131. *Id.* at 1355.

132. *Id.* at 1356.

133. *Id.* at 1357.

134. *Id.* at 1360. The court elaborated on the public notice function of the patent document:

Suitable notice to the public, however, requires that the public understand the language of both the claims and the written description. We have repeatedly explained that, in the absence of a compelling reason to do otherwise, claims must be interpreted as one of ordinary skill in the art would understand them . . . . It thus follows as a matter of simple logic that, in the absence of a compelling reason to do otherwise, the written description must also be interpreted according to the

The court then characterized the “other resilient materials” statement in the specification as a “generic” reference that did not give rise to dedication, but decided that the “[o]ther prior art devices” statement was more specific and did result in dedication of plastic materials.<sup>135</sup> We find this outcome defensible, but the set of legal determinations entailed in reaching it are not simple. As with claim construction rules, we are left wondering whether the summoning of the PHOSITA heuristic improves proximity enough to result in an acceptable complexity/proximity tradeoff.

The court’s decision in *Toro Co. v. White Consolidated Industries, Inc.*<sup>136</sup> amplifies our concerns. There, the court developed a customized rule, applicable only in the context of a disclosure-dedication issue, for determining what a patent discloses, instead of relying on established statutory precepts codified in 35 U.S.C. § 112.<sup>137</sup> According to the court:

Thus, the level of disclosure needed to implicate the disclosure-dedication rule is different from the level of disclosure required under § 112 to support claims defining the scope of coverage of an invention. Indeed, disclosures implicating the disclosure-dedication rule need not directly relate to the description of the claimed invention or be contained in the “Detailed Description of the Invention” section of the patent, but may appear merely in the portion of the patent describing the “Background of the Invention.”<sup>138</sup>

Applying its rule, the court concluded that the patentee had disclosed (but not claimed) a separate cover or ring structure

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understanding of one of ordinary skill in the art.

Taken together, then, one of ordinary skill in the art should be able to read a patent, to discern which matter is disclosed and discussed in the written description, and to recognize which matter has been claimed . . . . The ability to discern both what has been disclosed and what has been claimed is the essence of public notice. It tells the public which products or processes would infringe the patent and which would not.

*Id.* at 1359–60. The court may be commingling notions of the “public” with notions of the PHOSITA here, an analysis that we regard as unhelpful.

135. *Id.* at 1360.

136. 383 F.3d 1326 (Fed. Cir. 2004).

137. *See id.* at 1334.

138. *Id.*; *see also* Cent. Inst. for Experimental Animals v. Jackson Lab., 726 F. Supp. 2d 1045, 1047–49 (N.D. Cal. 2010) (finding sufficient disclosure to trigger rule). *But see* Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123, 167 (2006) (criticizing this outcome and advocating use of the 35 U.S.C. § 112 enablement inquiry to measure whether the disclosure is sufficient to trigger dedication).

based on the fact that the specification included a comment disparaging devices that used such a structure.<sup>139</sup>

In view of the complexity of these rules, it strikes us as folly to suggest that all of this is an exercise in discerning what the specification tells the “public at large” or even the hypothetical person of ordinary skill in the art. However, we are unsure whether conjuring up a different heuristic is likely to advance the law here. Instead, in this instance, the audience perspective may expose a flaw in the central premise of the disclosure-dedication rule—that is, the premise that it is likely that readers of the patent document will identify information about unclaimed subject matter at such a level of specificity that the reader could rely on that information to shape his or her own commercial activities. Outside the simplest case involving discrete embodiments that are expressly disclosed but not claimed, we think that this premise rests on unrealistic assumptions about the proximity between disclosure-dedication legal principles and the general public audience. If the court were to embrace our framework and reduce the rule’s complexity, the court could simply jettison the public dedication rule absent a clearly defined, alternative embodiment. The present doctrine conflates with claim construction: third parties would be mired in the confusion of assessing what the claim covers and then determining whether the specification sufficiently discloses an embodiment outside of the scope of the construed claims. We believe this complexity is not worth the candle.

Alternatively, though less attractively, the court could attempt to speak to a more proximate audience, such as patent attorneys and other sophisticates. Such an approach would require rejection of the PHOSITA construct and instead would focus on a more legally oriented perspective. Or the court could expressly link the rule to the enablement doctrine: an alternative can only be dedicated to the public if it is enabled by the patent but not claimed.<sup>140</sup> Of course, such an approach presents the issue of whether the enablement and other disclosure doctrines are appropriately constructed from an audience perspective, which we take up next.

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139. *Toro Co.*, 383 F.3d at 1334. It seems doubtful that such a disclosure would have satisfied the requirements of 35 U.S.C. section 112, paragraph 1.

140. One of us has previously advocated for this approach. See Holbrook, *supra* note 138.

#### 4. Patent Disclosure Rules

In order to obtain a patent, an applicant must disclose her invention in a manner sufficient to describe and allow others to practice the invention without undue experimentation.<sup>141</sup> The disclosure obligations represent the “quid pro quo” of the patent system: in order to obtain the exclusive rights of a patent, the inventor must disclose her invention to the public in a manner sufficient to allow others to practice the invention based on the patent.<sup>142</sup> By compelling disclosure, the patent system aspires to carry out a teaching function: to inject information about the workings of the invention into the general storehouse of knowledge, thereby advancing innovation.<sup>143</sup> Over time, the disclosure rules have also been called into service in other ways. They have been invoked to provide assurance that the scope of the patent rights correlates reasonably with the scope of the inventor’s contribution (as measured through the patent disclosure).<sup>144</sup> They also have been deployed for essentially eviden-

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141. See 35 U.S.C. § 112, ¶ 1 (2006) (“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art . . . to make and use the same.”).

142. See, e.g., *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057, 1072 (Fed. Cir. 2011). As the court put it,

[t]he information in patents is added to the store of knowledge with the publication/issuance of the patent. An important purpose of the system of patents is to negate secrecy, and to provide otherwise unknown knowledge to the interested public . . . . In turn, the subject matter of patents may be investigated and verified and elaborated; the technological/scientific contribution to knowledge is not insulated from analysis, study, and experimentation for the twenty years until patent expiration. This *quid pro quo* is fundamental to patent systems. The statutory requirements of description, enablement, and best mode, implement this policy, for these requirements facilitate understanding and elaboration of the inventor's contribution.

*Id.*

143. Once the patent expires, the disclosure permits others to freely copy the claimed invention. But even during the patent term, others can learn from, improve upon, and design around the patented invention. *Id.* at 1072–73 (“Were such information prohibited from study until patent expiration, not only would the advance of science be slowed, but the design-around of patented subject matter would be inhibited, if not excluded, if a new design could not be derived from study of the old.”). Some commentators have called the quid pro quo theory into doubt. See, e.g., Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401 (2010); Note, *The Disclosure Function of the Patent System (or Lack Thereof)*, 118 HARV. L. REV. 2007 (2005).

144. See *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008) (quoting *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195–96 (Fed. Cir. 1999)) (“The scope of the claims must be less

tiary purposes, to corroborate (through the patent disclosure) that the inventor completed the conception of the invention.<sup>145</sup>

In striving to satisfy these multifarious ambitions, the Federal Circuit has authored a convoluted jurisprudence of patent disclosure rules. The Federal Circuit has found three distinct disclosure requirements under 35 U.S.C. § 112, paragraph 1: written description, enablement, and best mode.<sup>146</sup> While the best mode requirement arguably has become a dead letter as a result of legislative changes in the America Invents Act,<sup>147</sup> distinguishing between the remaining two requirements—enablement and written description—remains a matter of considerable difficulty, even though the issue was fully ventilated by the Federal Circuit en banc.<sup>148</sup> Even the staunchest proponents of separate enablement and written description requirements would surely concede that the jurisprudence is among patent law's most complex, and perhaps among the most resistant to simplification, despite an abundance of efforts, both

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than or equal to the scope of the enablement' to 'ensure[] that the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims.'"). For example, an inventor who finds a vaccine for one particular type of RNA virus is not necessarily entitled to claim a vaccine against all such viruses, such as HIV, because she has not demonstrated how to make or use such a broad genus of vaccines. *See In re Wright*, 999 F.2d 1557, 1562–64 (Fed. Cir. 1993).

145. *See In re Costello*, 717 F.2d 1346, 1350 (Fed. Cir. 1983) (holding that an affidavit under Rule 132 “establishes conception”).

146. *See Star Sci., Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1373 (Fed. Cir. 2011) (explaining that, if one exists, the inventor must disclose the best mode of practice); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1344–45 (Fed. Cir. 2010) (en banc) (holding written description and enablement to be separate requirements).

147. With the enactment of the America Invents Act in September 2011, the best mode requirement is no longer a basis for invalidating or rendering a claim unenforceable. *See Leahy-Smith America Invents Act*, Pub. L. No. 112–29, § 15(a), 125 Stat. 284 (2011) (codified as 35 U.S.C. § 282(3)) (amending 35 U.S.C. § 282 to state, “the failure to disclose the best mode shall not be a basis on which any claim of a patent may be canceled or held invalid or otherwise unenforceable”). This amendment took effect “upon the date of the enactment of this Act [September 16, 2011] and shall apply to proceedings commenced on or after that date.” *Id.* at § 15(c).

148. We have given our views on these difficulties at great length elsewhere, and we are fairly certain that no one wants them repeated again here. Those who do should consult Brief of Mark D. Janis & Timothy R. Holbrook as Amici Curiae Supporting Neither Party, 2–3 *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336 (Fed. Cir. 2010) (No. 2008–1248), 2009 WL 3657814, (arguing that written description and enablement are not separate requirements under 35 U.S.C. § 112, para. 1).

judicial and academic, to more clearly elucidate the disclosure rules.

Without intending to dismiss continuing efforts to reduce rule complexity in the patent disclosure rules,<sup>149</sup> courts might instead devote more attention to offsetting that complexity by making proximity more favorable. The law has made a start at doing so, albeit rather a feeble one. The statute already provides that for purposes of the enablement requirement, the disclosure is to be assessed from the perspective of the PHOSITA, not the general lay audience.<sup>150</sup> Likewise, the Federal Circuit has held that whether a patent disclosure complies with the written description requirement is to be analyzed through the eyes of the PHOSITA.<sup>151</sup> It is widely understood that the PHOSITA heuristic is important here; assessing disclosures from the perspective of the lay public would impose large costs on patent applicants.<sup>152</sup>

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149. The Federal Circuit's reasoning in more recent enablement cases evidences a worthwhile effort to reduce complexity. *See, e.g.,* *Alza Corp. v. Andrx Pharms., LLC*, 603 F.3d 935, 941 (Fed. Cir. 2010) ("To satisfy the plain language of § 112, ¶ 1, ALZA was required to provide an adequate enabling disclosure in the specification; it cannot simply rely on the knowledge of a person of ordinary skill to serve as a substitute for the missing information in the specification."); *Auto. Techs. Int'l., Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1283 (Fed. Cir. 2007) ("Although the knowledge of one skilled in the art is indeed relevant, the novel aspect of an invention must be enabled in the patent.").

150. 35 U.S.C. § 112 (2006) (disclosure must be enabling from the perspective of "person skilled in the art to which it pertains, or with which it is most nearly connected"); *see also In re Nelson*, 280 F.2d 172, 181 (C.C.P.A. 1960) ("The descriptions in patents are not addressed to the public generally, to lawyers or to judges, but, as section 112 says, to those skilled in the art to which the invention pertains or with which it is most nearly connected."), *overruled on other grounds by In re Kirck*, 376 F.2d 936 (C.C.P.A. 1967). The Federal Circuit abides by this mandate. *See Boston Sci. Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1369 (Fed. Cir. 2011) (Gajarsa, J., concurring in part) ("The relevant test for enablement is whether the specification enables one of skill in the art to practice the claimed invention without undue experimentation.").

151. *See, e.g., Ariad*, 598 F.3d at 1351 (holding, for purposes of the written description requirement, "the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date").

152. If the law required that the general public be able to read the patent and understand the invention based on little more than the patent document alone, every patent document would need to be a textbook on elementary concepts in order to satisfy the disclosure requirements. The costs of preparing patent applications would increase significantly under such rules. The administrative and private costs of reviewing patent documents might also rise in

In our view, much more needs to be done given the high degree of complexity. First, a far more robust incarnation of the PHOSITA is needed. We see this occurring on a case-by-case basis in some of the enablement cases, largely around debates over what extent of experimentation on the part of the PHOSITA should be deemed undue.<sup>153</sup> However, we see virtually none of it in the written description jurisprudence.

Second, for reasons similar to those that we have discussed above,<sup>154</sup> the PHOSITA heuristic may simply be the wrong one in cases where the disclosure doctrines are being invoked for purposes of checking the scope of a patent. The disclosure doctrines in such cases are serving essentially as a fulcrum for a legal judgment about claim scope. Such matters are, in the first instance, directed to lawyers and other sophisticates who can digest the complex doctrines surrounding the relationship between scope and disclosure. We have no simple solution for reformulating disclosure doctrines to account for this insight about proximity. We can say that our observations about the blended nature of disclosure doctrines—particularly the fact that those doctrines are more heavily indebted to law than traditional accounts admit—align with those of other scholars who have commented on the dichotomous nature of the disclosure itself.<sup>155</sup> Indeed, reliance on the rhetoric of the PHOSITA may do little more than obscure the manner in which the court actually applies the disclosure doctrines.

Finally, the arguments that we have made apply with even greater force in cases in which the disclosure doctrine at issue is being used to corroborate that conception of the invention

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view of the need for readers to sift through immense volumes of boilerplate technical recitations.

153. See, e.g., *MagSil Corp. v. Hitachi Global Storage Techs., Inc.* 687 F.3d 1377, 1380–84 (Fed. Cir. 2012); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371, 1378–80 (Fed. Cir. 2007); *In re Wands*, 858 F.2d 731, 736–40 (Fed. Cir. 1988).

154. See discussion *supra* Part III.A.1.

155. See Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 119–24 (2009) (advocating actual reduction to practice requirement); Jeanne C. Fromer, *Patent Disclosures*, 94 IOWA L. REV. 539, 564–94 (2009) (proposing that patent documents be “layered” with both legal and technical portions to target specific audiences); Holbrook, *supra* note 62, at 819–25 (advocating use of presumptions to balance technical and legal components of a patent’s disclosure); Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621, 641 (arguing for the inclusion of working examples in patent documents).

was completed.<sup>156</sup> It is a fallacy to suggest that by simply summoning up the PHOSITA and denominating the inquiry a question of fact,<sup>157</sup> the legal analysis approximates an objective, predictable inquiry driven mainly by technical facts. It is, instead, an extraordinarily subtle legal judgment requiring application of the rules of conception, folded into the disclosure rules. The courts should acknowledge this problem when invoking the written description requirement in such a context, and scholars should develop alternative heuristics that move the inquiry away from mere reliance on the PHOSITA.

##### 5. Audience and Freedom-to-Operate: The Example of Divided Infringement Claims

Assessing one's exposure to patent infringement liability is not an intuitive exercise, notwithstanding the patent law's standard rhetoric about the patent document supplying meaningful notice to the public. As the foregoing discussion highlights, it is difficult enough to analyze patent scope, which depends on an array of legal determinations that are not necessarily evident from the face of the patent document. It is then more difficult to analyze whether one's activities would fall within a patent's properly-delineated scope. This latter analysis, the infringement analysis, is nominally a question of fact, but calls for the application of a number of legal principles that few laypersons have absorbed.

This phenomenon—which triggers the need for members of the public to consult with counsel to determine whether their activities tread on the property rights of others—is certainly not unique to patent law. Indeed, it is not news, and would

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156. Typically, the written description requirement is the disclosure rule at issue in such a case. See *Falko-Gunter Falkner v. Inglis*, 448 F.3d 1357, 1367 n.13 (Fed. Cir. 2006) (“In contrast to reduction to practice, conception is a prerequisite to an adequate written description.”); *Fiers v. Revel*, 984 F.2d 1164, 1171 (Fed. Cir. 1993) (explaining that “one cannot describe what one has not conceived”).

157. Compare *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1355 (Fed. Cir. 2010) (en banc) (“A determination that a patent is invalid for failure to meet the written description requirement of 35 U.S.C. § 112, 1 is a question of fact, and we review a jury's determinations of facts relating to compliance with the written description requirement for substantial evidence.” (quoting *PIN/NIP, Inc. v. Platte Chem. Co.*, 304 F.3d, 1235, 1243 (Fed. Cir. 2002))), with *Ariad Pharms., Inc.*, 598 F.3d at 1366 (Rader, J., dissenting) (“[A] test becomes no less subjective merely because it asks a fact finder to answer the subjective question objectively. This court still asks the fact finder to imagine what a person of skill in the art would have understood the inventor to have subjectively possessed based on the description of the specification . . .”).

hardly be cause for comment, but for the emergence of an unfavorable trend in patent law, a trend towards injecting more complexity into patent infringement determinations without much attention to other doctrinal strategies that mitigate the complexity.

The patent statute's main infringement provision, 35 U.S.C. § 271(a), places considerable pressure on courts to develop a transparent jurisprudence on infringement. Section 271(a) is a strict liability provision, and it reaches virtually any unauthorized act of exploitation of a claimed invention, including mere uses. For example, a consumer who carries out a routine task on a smartphone may well be using inventions claimed in dozens of patents. If the smartphone manufacturer has incorporated those inventions without a license, the consumer's use, even if innocent, may well constitute an act of infringement. In terms of the analysis that we have set forth here, this scenario is important because it presents a potential proximity concern: the patent infringement rule binds a diffuse audience of patent law outsiders. Accordingly, patent infringement rules that entail even moderate levels of complexity are likely to stray from the preferred balance of complexity and proximity in our calculus.

The controversy over so-called "divided" infringement illustrates the trend towards unmitigated complexity in modern patent infringement analysis.<sup>158</sup> To understand the controversy, it is helpful to understand the corollary debate over what constitutes an act of infringing "use" of a method invention, as contrasted with a system invention. Under the Federal Circuit's case law, in order for an actor to be liable for infringing use of a method invention under § 271(a), the actor must (ordinarily) carry out all of the steps of the claimed method.<sup>159</sup> By contrast, an actor can be liable under § 271(a) for infringing use of a system invention even if the actor does not control all of the elements of the system, as long as there exists some entity that maintains control over the system as a whole and receives a benefit when the system is used.<sup>160</sup>

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158. See generally Mark. A. Lemley, et al., *Divided Infringement Claims*, 33 *AIPLA Q.J.* 255, 256–63 (2005).

159. See *Muniauction, Inc. v. Thompson Corp.*, 532 F.3d 1318, 1329 (Fed. Cir. 2008); *BMC Inc. v. Paymentech*, 498 F.3d 1373, 1378 (Fed. Cir. 2007), *overruled on other grounds by Akamai Techs., Inc. v. Limelight Networks, Inc.*, No. 2009-1372, 2012 WL 3764695 (Fed. Cir. Aug. 31, 2012) (per curiam).

160. See *Centillion Data Sys., LLC v. Qwest Comms. Int'l, Inc.*, 631 F.3d 1279, 1283–84 (Fed. Cir. 2011); *NTP, Inc. v. Research in Motion, Ltd.*, 418

In a series of cases, many involving patents on Internet-based methods, the method claims were drafted in a way that called for multiple actors each to participate in carrying out selected steps of the method.<sup>161</sup> Collectively, all of the steps were performed, but no single actor performed all of them, presenting a question about whether any given actor could be deemed to have engaged in an act of unauthorized use of the patented method. To resolve the question, the court ruled that if one actor is the agent of another, or is contractually obligated to perform the steps of the method, then the court will treat the multiple actors as a single entity for purposes of discerning an act of infringing use.<sup>162</sup> In theory, such a rule again highlights the proximity problem, because the Internet-using general public is typically one of the multiple actors whose activities are at issue in these cases.

The Federal Circuit appeared to be set to reevaluate the wisdom of the single-actor rule for method claims (and derogations from that rule) in two co-pending *en banc* cases, *Akamai Technologies, Inc. v. Limelight Networks, Inc.*<sup>163</sup> and *McKesson Technologies Inc. v. Epic Systems Corp.*<sup>164</sup> Members of the patent community expected the court to address the single-entity rule, and perhaps eliminate the bifurcated state of the law with respect to methods and systems. It also was an occasion for the court to revisit these doctrines with an eye on the relevant au-

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F.3d 1282, 1317 (Fed. Cir. 2005). The court in *NTP* adopted this rule to determine the locus of infringement for a system that straddled the United States and Canadian border; the court extended this rule for wholly domestic infringement in *Centillion*. See *Centillion*, 631 F.3d at 1284. For criticisms of both the bifurcation of methods and systems claims and of the “control and beneficial use test,” see Timothy R. Holbrook, *Extraterritoriality in U.S. Patent Law*, 49 WM. & MARY L. REV. 2119, 2153, 2158–59 (2008) (arguing that “[t]he bifurcated approach to explaining the ‘use’ of an invention belies the clear statutory structure. There is no reason that ‘use’ of a method should be viewed as different from the ‘use’ of a system” and criticizing the “control and beneficial test” as “fatally ambiguous”).

161. See *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1309 (Fed. Cir. 2011); *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 629 F.3d 1311, 1318–22 (Fed. Cir. 2010), *rev'd and remanded*, No. 2009–1372, 2012 WL 3764695 (Fed. Cir. Aug. 31, 2012) (*en banc*); *Muniauction, Inc. v. Thompson Corp.*, 532 F.3d 1318, 1329 (Fed. Cir. 2008); *BMC Inc. v. Paymentech*, 498 F.3d 1373, 1378 (Fed. Cir. 2007), *overruled on other grounds by Akamai Techs., Inc. v. Limelight Networks, Inc.*, No. 2009–1372, 2012 WL 3764695 (Fed. Cir. Aug. 31, 2012) (*per curiam*).

162. *Akamai*, 629 F.3d at 1318–22.

163. 629 F.3d 1311 (Fed. Cir. 2010), *vacated*, 419 Fed. Appx. 989 (Fed. Cir. 2011) (*en banc*).

164. *Akamai*, 2012 WL 3764695.

dience. Instead, the court side-stepped the single-entity issue. The court retained the “agency or contractual” obligation test for direct infringement of patented methods and did not alter the “control or beneficial use” test for infringement of systems. Instead, it redefined active inducement of infringement under 35 U.S.C. § 271(b).<sup>165</sup> Now, “[i]f a party has knowingly induced others to commit the acts necessary to infringe the plaintiff’s patent and those others commit those acts, there is no reason to immunize the inducer from liability for indirect infringement simply because the parties have structured their conduct so that no single defendant has committed all the acts necessary to give rise to liability for direct infringement.”<sup>166</sup>

Under our calculus, the *Akamai/McKesson* result is a mixed blessing. By shifting the analysis to § 271(b) inducement, the court reduced the scope of the potential affected audience, because § 271(b) liability extends only to those who have knowledge of the patent and an intent to induce acts of infringement. As such, the only parties that are liable for inducing such infringement are those that have actively engaged in the patent system and have awareness of the patent *and* a belief that the activity they are inducing is infringing.<sup>167</sup> Such actors must be quite familiar with the patent system and law to form such an intent. They are not terribly remote from the courts; the court therefore made the law here more proximate to it. The use of active inducement, therefore, is a gain in proximity, in our terms. As a practical matter, the gain may be con-

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165. *Id.* at \*3–4. There may be some unintended consequences to the court’s redefinition of induced infringement. See Timothy R. Holbrook, *The Potential Extraterritorial Consequences of Akamai*, EMORY INT’L L. REV. (forthcoming 2013), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2154277](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2154277) (noting that, because § 271(b) has no territorial limits, the court may have expanded the reach of patents over methods that straddle national borders).

166. *Akamai*, 2012 WL 3764695, at \*4.

167. *Global-Tech Appliances, Inc. v. SEB S.A.*, 131 S. Ct. 2060, 2068 (2011) (holding “that induced infringement under § 271(b) requires knowledge that the induced acts constitute patent infringement”); *DSU Med. Corp. v. JMS Co., Ltd.*, 471 F.3d 1293, 1304–06 (Fed. Cir. 2006) (en banc in relevant part) (required to induce infringement, as opposed to induce the acts constituting infringement, for liability under § 271(b)). Of course, the lack of the requisite intent and knowledge would seemingly only preclude damages; such inducers could still be subject to an injunction if they continue activity after the suit is filed. See Timothy R. Holbrook, *The Intent Element of Induced Infringement*, 22 SANTA CLARA COMP. & HIGH TECH. L.J. 399, 407 (2006); Jason A. Rantanen, *An Objective View of Fault in Patent Infringement*, 60 AM. U. L. REV. 1575, 1603 n.162 (2011).

siderable, if, as we suspect, many future cases of this type will be framed as inducement cases.

On the other hand, the court's approach leaves intact the complexity associated with the agency/contractual obligation test for § 271(a) infringement of method claims, and the control/beneficial use test for § 271(a) infringement of system claims, and does nothing to improve proximity. This bifurcated approach does little to afford better notice to the public. It assumes that the public would be aware not only of the dichotomous case law but also of whether the claims in a particular patent cover a method or system. Thus, courts could reconsider the entirety of this doctrine with a focus on enhancing proximity through the use of heuristic. In other words, the courts may want to address the issue of divided infringement from the perspective of an intermediary. Our ubiquitous intermediary, the PHOSITA, would not seem appropriate as "single-entity" doctrine and "control and beneficial use" test are not tied to technological know-how. The use of a "reasonable patent attorney or litigator" would also be ill-fitting because these doctrines do not have their genesis in patent law but instead are creatures of tort law. Under the current law, even patent law sophisticates may struggle to understand the nuances involved in assessing whether these standards have been met, though one would expect that such sophisticates would come to learn more about the application of agency principles over time.

In sum, our proximity/complexity matrix is useful here as a new way to frame the divided infringement problem. It may also be useful as a design tool to the extent that it focuses decision-makers on the benefits of achieving more favorable proximity.

#### B. PROXIMITY AND EX ANTE INCENTIVES IN PATENTABILITY DOCTRINES

The complexity/proximity tradeoff also has implications for the formulation of patentability doctrines. We focus here on the statutory bars to patentability—rules that bar patent protection for inventions that have been the subject of certain disclosures or sales occurring before the application filing date. There are three reasons for choosing the statutory bars. First, the statutory bars have traditionally been of immense practical significance in patentability assessments, both in *ex parte* prosecution and in assessments of validity after patent issuance. Second, they are tied closely to the *ex ante* incentives that

the patent system purports to provide. Third, and perhaps most importantly, the patentability rules (of which the statutory bar provisions are a subset) have just undergone the most comprehensive structural reform in the history of the U.S. patent system.<sup>168</sup> This reform has eliminated the invention-date provisions and has reformulated and restated the statutory bar provisions.<sup>169</sup> Courts will soon begin conforming the existing patentability case law to these amended provisions. This is a unique opportunity for the Federal Circuit to reexamine and refine its statutory bar jurisprudence. The audience analysis—and particularly its insistence on consciously accounting for the complexity/proximity tradeoff—offers one framework for carrying out this exercise, as we discuss.

### 1. The On-Sale Bar to Patentability

Inventors can only receive a patent if their inventions are novel and nonobvious relative to what is already known, referred to in patent parlance as the prior art.<sup>170</sup> Under the 1952 Patent Act, patentability over the prior art is assessed as of the date of invention,<sup>171</sup> with a crucial exception: a patent is barred if, more than one year before the application filing date, the invention was patented, disclosed in a printed publication, on sale, or in public use.<sup>172</sup> Under the America Invents Act (AIA),

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168. See generally Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 328 (2011) (providing for patent reform).

169. These changes convert the U.S. patent system from a first-to-invent system into a first-to-file system. See Robert A. Armitage, *Understanding the America Invents Act and Its Implications for Patenting*, 40 AIPLA Q.J. 1, 22–24 (2012).

170. See *id.* at 11 (“This new, transparent definition for what qualifies as ‘prior art,’ which is then used to determine novelty and non-obviousness of a claimed invention, sits alongside the three remaining core legal issues of patent validity.”).

171. See 35 U.S.C. § 102(a) (“A person shall be entitled to a patent unless . . . the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent.”); *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576 (Fed. Cir. 1996) (“Any suggestion that a document is prior art because it appears before the filing date of a patent ignores the requirements of section 102(a). Section 102(a) explicitly refers to invention dates, not filing dates. Thus, under section 102(a), a document is prior art only when published before the invention date.”).

172. 35 U.S.C. § 102(b) (“A person shall be entitled to a patent unless . . . the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.”).

patentability is no longer assessed as of the invention date, but rather, the filing date of the patent.<sup>173</sup>

The statutory bar rules—whether in their 1952 or 2011 incarnations—are presumed to be closely tied to the ex ante incentives that the patent grant purports to provide. To invoke but one familiar example, the ex ante “incentive to invent” theory of patent law suggests that the promise of patent protection will induce would-be innovators to engage in the inventive enterprise because they know they will be able to recoup their sunk, fixed research and development (R&D) costs over the lifetime of the patent by exploiting the patent’s exclusionary power.<sup>174</sup> However, where the information embodied in an invention is already accessible to the public, or is already the subject of commercial dealings, the social welfare losses from a patent grant would exceed the gains, and, in theory, the patent system should not encourage investments in such inventive activity. Thus, the statutory bar rules play a crucial role in shaping the patent incentive to serve the patent system’s instrumental goals.

An operative assumption—too frequently overlooked—is that the statutory bar rules actually communicate these incentives effectively, meaning that they communicate to the audience of relevant decision-makers, at a point in time to affect a decision whether to invest effort and resources in invention. In at least some settings, and perhaps many settings, this is pure fantasy. The rules purport to speak to an audience that encompasses anyone who *might become* an innovator, *before* they have committed resources to developing an innovation. Moreover, at least under the incentive-to-invent theory, the pertinent

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173. Leahy-Smith America Invents Act, § 3(b)(1) (amending 35 U.S.C. § 102(a) effective March 16, 2013) (“A person shall be entitled to a patent unless: (1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention . . .”). Under the AIA, a significant change is that third party sales and uses are not subject to the one-year grace period and automatically render the patent unpatentable. *Id.*

174. See Christopher A. Cotropia, *What is the “Invention”?*, 53 WM. & MARY L. REV. 1855, 1892 (2012) (“The incentive-to-invent theory is the classic justification for the patent system. Under this theory, patent law incentivizes the creation of inventions by giving the inventor a mechanism by which she can recoup her development costs: exclusivity. The incentive to-invent theory assumes the exclusive rights to the invention allow the inventor to price the invention more like a monopolist, thus above marginal cost. The potential for this additional revenue is what entices a would-be inventor to try to invent.”). See generally Eisenberg, *supra* note 10, at 1024–28.

incentives purport to operate *before* the inventor even undertakes the inventive activity, and presumably long before the inventor actually consults with a patent attorney or other sophisticated intermediary who can translate raw patent law rules into particularized action items guiding prospective R&D activity. In addition, the patent system cannot necessarily rely upon social norms as mechanism for conveying the requisite incentives message. Absent special circumstances,<sup>175</sup> it is not clear that relevant social norms exist, or are embedded to an extent comparable to other areas of law.<sup>176</sup> As the *Lough* case demonstrates, inventors of reasonable intelligence, operating in apparent good faith may be utterly unaware of the arcane rules that govern whether an inventor is entitled to patent protection.<sup>177</sup> This is surely one of patent law's most severe proximity problems. The need for robust bridging heuristics, and/or for restraint against rule complexity, is paramount.

The law as currently formulated falls far short, indulging in some refinements in the name of enhancing "certainty" but ignoring the proximity problem. Consider, for example, the on-sale bar case law. The Supreme Court, addressing the legal standard for when an invention should be considered "on sale" under § 102(b) of the 1952 Act, discarded the Federal Circuit's "totality of the circumstances" test as insufficiently certain, and instead substituted a two-part standard: an invention is "on sale" if the product is (1) "the subject of a commercial offer for sale," and (2) of subject matter that is "ready for patenting."<sup>178</sup> The Court left no doubt that it expected inventors to be capable of decoding this rule, noting that "[a]n inventor can both under-

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175. These circumstances could include an experienced inventor drawing on past experience (such as past consultations with patent lawyers), or a corporate R&D group drawing upon general norms embedded in corporate culture through periodic educational efforts undertaken by in-house counsel.

176. For example, contrast intellectual property law with criminal law. Many aspects of the criminal law may be considered to coincide roughly with social norms, so there is a level of compliance among the general population that arises even absent actual awareness or decoding of the formal law. See Jeanne M. Fromer, *Expressive Incentives in Intellectual Property*, 98 VA. L. REV. (forthcoming 2012) (manuscript at 25) (on file with authors) ("This view of the harmonious interaction on law and norms has important implications for intellectual property laws with regard to incentive design. Just as criminal law can obtain deterrence by imposing retributive punishments that communally shame offenders, so too can intellectual property laws provide utilitarian incentives to create sounding in moral rights.")

177. *Lough v. Brunswick Corp.*, 86 F.3d 1113, 1124 (Fed. Cir. 1996) (Plager, J., dissenting).

178. *Pfaff v. Wells Elecs.*, 525 U.S. 55, 67–68 (1998).

stand and control the timing of the first commercial marketing of his invention.”<sup>179</sup>

We see many reasons to doubt that the result is a favorable tradeoff of complexity and proximity. The first prong of the test is more complex than courts have acknowledged. Under the Federal Circuit’s interpretation, the first prong is met only when the commercial activity would constitute a formal offer to sell under contract law.<sup>180</sup> The Federal Circuit justified this gloss on the Supreme Court’s language on the basis of certainty,<sup>181</sup> but we believe that we could identify many first-year law students who could confirm that determining what constitutes a contract offer is not necessarily an exercise in simple intuition.<sup>182</sup> More importantly, such a rule is directed to lawyers (or other similarly proximate intermediaries). Few technologists would understand the complex inquiries that would be needed to assess whether certain commercial activity constitutes a formal offer to sell, as opposed to mere “invitations” for offers or even offers to buy the invention. Of course, one might argue that many patent applicants are corporate inventors<sup>183</sup> whose employers may be repeat players with sophisticated legal staffs that help translate patentability rules to them. But others are

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179. *Id.* at 67. It seems highly likely the courts will adopt this same definition for the on-sale activity under the America Invents Act (AIA), given that the statute uses identical language to the 1952 Act. For a discussion of the relationship between the on-sale bar under the 1952 Patent Act and the AIA, see Timothy R. Holbrook, *Territoriality and Tangibility after Transocean*, 61 EMORY L.J. 1087, 1112 (2012).

180. See *Rotec Indus., Inc. v. Mitsubishi Corp.*, 215 F.3d 1246, 1254–55 (Fed. Cir. 2000). See generally Timothy R. Holbrook, *Liability for the “Threat of a Sale”: Assessing Patent Infringement for Offering to Sell an Invention and Implications for the On-Sale Patentability Bar and Other Forms of Infringement*, 43 SANTA CLARA L. REV. 751, 764–84 (2003) (discussing and criticizing the formal commercial offer standard on audience grounds).

181. *Grp. One, Ltd. v. Hallmark Cards, Inc.*, 254 F.3d 1041, 1047 (Fed. Cir. 2001) (“Applying established concepts of contract law, rather than some more amorphous test, implements the broad goal of *Pfaff*, which, in replacing this court’s ‘totality of the circumstances’ test with more precise requirements, was to bring greater certainty to the analysis of the on-sale bar.”).

182. See generally Lucas S. Osborne, *‘Offers to Sell’ as a Policy Tool*, 53 SANTA CLARA L. REV. (forthcoming 2012), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2026941](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2026941) (deconstructing the meaning of the traditional contract-law “offer”).

183. See John R. Allison & Mark A. Lemley, *Who’s Patenting What? An Empirical Exploration of Patent Prosecution*, 53 VAND. L. REV. 2099, 2101 (2000) (finding more than 80% of patents are assigned to companies). Nevertheless, 20% of patents are not, meaning that there is a substantial number of inventors operating without necessarily ready access to patent attorneys during the inventive process.

not, and, as the *Lough* case illustrates, they are equally bound by the rules.<sup>184</sup> Moreover, by framing the first prong in a manner that could only be comprehensible to sophisticates,<sup>185</sup> the Federal Circuit's approach is in tension with the Supreme Court's apparent preference for fashioning a rule for the inventor community.<sup>186</sup>

The second prong of the on-sale bar test also highlights the problem with the on-sale bar in terms of the complexity/proximity tradeoff. The Supreme Court noted that, to trigger the on-sale bar, the invention must be "ready for patenting."<sup>187</sup> An invention is "ready for patenting" when the inventor has either built a working embodiment (a reduction to practice) or prepared diagrams or descriptions sufficient to enable a person of ordinary skill to make the invention.<sup>188</sup> Generally, the decision of whether an invention is complete enough to warrant a patent application is assessed by a patent attorney. This is quite similar to the proximity problem that we identified in previous sections where a rule depends upon construction of the patent specification.<sup>189</sup>

Our audience analysis, then, places the complexity and proximity problems with the on-sale bar into sharper focus. It does not point ineluctably to a quick solution to those problems. Regarding the proximity problem, we are skeptical that simply integrating the PHOSITA more fully into the on-sale bar test will bring the test more in line with its apparent aspiration of communicating directly to would-be inventors. Such a move might improve the transparency of the second prong, but would do little or nothing for the first. As for the complexity problem, we regard the Court's two-pronged test as having reduced complexity only marginally,<sup>190</sup> but we are not prepared here to pro-

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184. *Lough v. Brunswick Corp.*, 86 F.3d 1113, 1124 (Fed. Cir. 1996) (Plager, J. dissenting).

185. The Federal Circuit's interest in certainty is addressed to the *courts*, not necessarily to actors in the patent system. See *Grp. One*, 254 F.3d at 1047 ("Courts are quite accustomed to and comfortable with determining whether a particular communication or series of communications amounts to an offer in the contract sense." (emphasis added)).

186. *Pfaff v. Wells Elecs.*, 525 U.S. 55, 67 (1998).

187. *Id.* at 67–68.

188. *Id.*

189. See *supra* Section III.A (discussing the proximity/complexity problem with patent scope doctrines).

190. See Timothy R. Holbrook, *The More Things Change, the More They Stay the Same: Implications of Pfaff v. Wells Electronics, Inc. and the Quest for Predictability in the On-Sale Bar*, 15 BERKELEY TECH. L.J. 933, 960 (2000)

pose a better alternative. Our instinct is that on-sale bar jurisprudence is in need of concurrent efforts to continue to reduce complexity (perhaps by articulating and experimenting with inventor safe harbors, for example) while also addressing the proximity problem through the use of the PHOSITA or other means.

## 2. The Public-Use Bar to Patentability and the Experimental-Use Negation

The jurisprudence of the public-use bar of § 102(b) of the 1952 Patent Act (which is likely to be taken up, in large part, for purposes of analyzing the use bar of § 102(a) of the AIA), likewise does not hold up well when analyzed in terms of the complexity/proximity tradeoff. Unlike the on-sale bar, which frequently presents hard questions about whether the subject matter at issue was ready for patenting,<sup>191</sup> the public-use bar typically revolves around questions about whether the use at issue should be deemed public. In some cases, this question can be resolved intuitively based on common sense indicia of public accessibility, such as whether the use was undertaken in a public place, or whether the use was visible to the public. However, in other cases, including some early, now-famous cases, courts declared uses to be public based primarily on policy assessments rather than any accessibility calculus. For example, in *Egbert*, the Court found a use public because it considered the inventor to have relinquished control over a prototype of the invention, behavior that the Court apparently sought to discourage quite independently of whether the prototypes were likely to have been viewed by the public.<sup>192</sup> In another famous case, Judge Learned Hand found a patented method to be in

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(“The myriad of factual circumstances identified by the courts belies the predictability and the certainty that the Supreme Court had hoped would emerge from its new test. Indeed the facts relevant under the ‘ready for patenting’ test are very similar to those under the ‘substantially complete’ test.”).

191. Only rarely have the courts even explicitly recited a “ready for patenting” element of the public-use test. *But see* *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1379–80 (Fed. Cir. 2005) (requiring that the use be public and that the subject matter be ready for patenting).

192. *Egbert v. Lippmann*, 104 U.S. 333, 337–38 (1881) (holding that use of invention in undergarments, never exposed to the general public, constitutes invalidating public use); *see also id.* at 339 (Miller, J., dissenting) (“If the little steel spring inserted in a single pair of corsets, and used by only one woman, covered by her outer-clothing, and in a position always withheld from public observation, is a *public* use of that piece of steel, I am at a loss to know the line between a private and a public use.”).

public use by an inventor even when it was kept secret because the inventor had commercialized the product of that process.<sup>193</sup>

Thus, the inquiry of whether use is “public” is potentially complex, and this is problematic because, like the on-sale bar, the public-use bar purports to influence directly the investment decisions of would-be innovators. In fact, our discussion to this point understates the complexity/proximity problem, because we have not accounted for the experimental-use doctrine, the doctrine that was at issue in *Lough*. Under current case law, if the use was directed primarily to experimental activity, then the public-use bar is not triggered.<sup>194</sup> The Supreme Court, in *City of Elizabeth v. American Nicholson Pavement Co.*, noted that “[t]he use of an invention by the inventor himself, or of any other person under his direction, by way of experiment, and in order to bring the invention to perfection, has never been regarded as such a [public] use.”<sup>195</sup>

Perhaps no other doctrine in patent law presents a more intractable complexity/proximity problem than does the experimental-use negation of the on-sale and public-use bars. While the policies underlying the experimental-use negation are probably intuitive even for non-lawyers,<sup>196</sup> the law that implements those policies has become exceptionally difficult to parse. The Federal Circuit has advocated the use of thirteen non-exclusive factors for assessing whether a particular use or sale is experimental in nature.<sup>197</sup> Even patent sophisticates would

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193. *Metallizing Eng'g Co. v. Kenyon Bearing & Auto Parts Co.*, 153 F.2d 516, 520 (2d Cir. 1946).

194. *See, e.g., Lough v. Brunswick Corp.*, 86 F.3d 1113, 1120 (Fed. Cir. 1996) (discussing experimental-use negation in the public-use bar context). The experimental nature of an inventor's activity could also negate what would otherwise constitute an on-sale bar. *See, e.g., Electromotive Div. of Gen. Motors Corp. v. Transp. Sys. Div. of Gen. Elec. Co.*, 417 F.3d 1203, 1211–12 (Fed. Cir. 2005) (stating that experimental use in the on-sale bar context negates the commerciality of the offer).

195. 97 U.S. 126, 134 (1877).

196. The experimental use exception to the statutory bars is designed to afford the inventor time to finalize the invention even in circumstances where the inventor might derive some incidental benefit from the use and where others may be aware of the invention. *See, e.g., id.* at 135. Without the experimental use safety valve, inventors theoretically would have to race to the USPTO to file applications on inventions that are not fully developed and not amenable to being disclosed adequately to satisfy the obligations of 35 U.S.C. § 112 (2006).

197. *EZ Dock, Inc. v. Schafer Sys., Inc.*, 276 F.3d 1347, 1357 (Fed. Cir. 2002) (Linn, J., concurring). The court identified the following thirteen factors: (1) the necessity for public testing; (2) the amount of control over the experi-

have difficulty predicting whether a particular use would qualify as “experimental,” let alone a technologist unfamiliar with patent doctrine. Judge Lourie’s characterization of the public-use analysis confirms that this doctrine is far up on the complexity axis:

With respect to both public use and experimental use, courts have been accustomed to referring to their determinations as involving “the totality of circumstances,” a phrase that some have objected to as being indefinite. What this phrase conveys is simply the process by which judges decide legal issues based on various facts that have been determined, utilizing the tools that judges always use, *viz.*, the language of the statute, the purposes of the statute as indicated by legislative history, etc. Cases depend on facts, but they involve legal judgments.<sup>198</sup>

The *Lough* case epitomizes the disconnect between the complexity of the law and the distant audience of inventors. As Judge Plager explained in his dissent in *Lough*:

Of course it would have been better for all . . . if Mr. Lough had read our prior opinions before he became an inventor. Then he might have kept detailed lab notes setting out the problem and the possible solutions, and he wisely would have obtained written confidentiality agreements from those allowed to see or use his prototypes. Had he studied our cases first, he no doubt would have developed a detailed questionnaire for the persons to whom he provided the seals, and he would have insisted on periodic written reports . . . . Instead, he did what seemed appropriate in the setting in which he worked: he waited to hear from his test cases what problems might emerge, and, hearing none, at least none that convinced him he was on the wrong track, he accepted some friendly advice and proceeded to patent his invention . . . . Yes, he failed to conduct his testing, his experiments, with the careful attention we lawyers, with our clean and dry hands, have come to prefer.<sup>199</sup>

To us, Lough’s acts are quite plausibly experimental, especially if viewed from the perspective of an inventor who is unaware of the complexities of patent law. Indeed, the jury also

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ment retained by the inventor; (3) the nature of the invention; (4) the length of the test period; (5) whether payment was made; (6) whether there was a secrecy obligation; (7) whether records of the experiment were kept; (8) who conducted the experiment; (9) the degree of commercial exploitation during testing; (10) whether the invention reasonably requires evaluation under actual conditions of use; (11) whether testing was systematically performed; (12) whether the inventor continually monitored the invention during testing; and (13) the nature of contacts made with potential customers. *Id.*; accord *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1353 (Fed. Cir. 2002) (reciting thirteen factors).

198. *Lough v. Brunswick Corp.*, 103 F.3d 1517, 1519 (Fed. Cir. 1997) (Lourie, J., concurring in order declining suggestion for rehearing en banc).

199. *Lough*, 86 F.3d at 1124 (Plager, J., dissenting).

thought that his acts were reasonable.<sup>200</sup> Yet, the court, as a legal matter, refused to find Lough's activities to be sufficient for experimentation. Indeed, Judge Lourie dismissed the audience concern, noting "[t]he fact that members of the public may not know for certain what a judge or panel of judges may decide on a particular matter is hardly a criticism of the system of assigning fact-law labels to issues for decision."<sup>201</sup> We advocate just the opposite approach: consideration of the appropriate audience is crucial to designing an efficiently operating patent system, particularly if we expect members of the community to respond to the incentives it purports to provide.

In its more recent efforts to deal with the experimental-use negation, the Federal Circuit has appeared to lock on to concerns about doctrinal complexity. For example, notwithstanding its fealty to the thirteen-factor test, the court has elevated two factors, control and customer awareness, as being more equal than the others, designating them as necessary conditions for experimental use.<sup>202</sup> If an inventor has not exercised sufficient control and the customer is not aware of the experimental nature of the use, then there can be no experimental-use negation, according to this rendition of the doctrine. The presence of control and awareness permit a finding of experimental use, though the fact finder would need to consider the other factors as well; control and awareness, therefore are necessary though perhaps not sufficient conditions.

The court's move to reduce complexity is laudable in principle, but we have many reservations about it. First, we are dubious about its durability. That these factors are necessary but not alone sufficient suggests that courts will draw upon other factors perhaps to trump any finding of experimental use. The

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200. *Id.* at 1118 ("A jury found that Brunswick failed to prove that Lough's invention was in public use before the critical date."); *see also Lough*, 103 F.3d at 1522–23 (Newman, J., dissenting from order declining suggestion for rehearing en banc) (reciting facts and inferences supporting the jury's verdict).

201. *Lough*, 103 F.3d at 1519 (Lourie, J., concurring in declination of en banc review).

202. *See* *Electromotive Div. of Gen. Motors Corp. v. Transp. Sys. Div. of Gen. Elec. Co.*, 417 F.3d 1203, 1214–15 (Fed. Cir. 2005); *see also Lough*, 103 F.3d at 1526 (Michel, J., dissenting from order declining suggestion for rehearing en banc) ("I would take the case in banc to reaffirm our classification of public use as ultimately an issue of law and also to identify certain indicia of 'control,' *e.g.*, record keeping, secrecy agreements, testing protocols, supervision of testing, reports to the inventor or restricted access to others, proof of which should be *required* before any potentially barring use in public can, on grounds of experimentation, avoid the public use bar.").

likely reason for so many factors is that there is an underlying equitable impulse that has driven judicial decisions in this area. We do not believe that merely elevating two factors will remove that impulse. Moreover, and more troubling, we are not so sanguine that these two factors are actually more important than the others. As to control, there may be circumstances, such in the *Lough* case, where formal control may be lacking but informal, social norms may suggest that there was in fact experimentation. As to customer awareness, it remains unclear to us why this factor has been elevated at all. If the experimental-use doctrine is in essence gauging the level of development of the invention, then subjective awareness of the customer seems too peripheral. Additionally, it could very well be that there *is not* a customer, at least in the public-use context. Thus, customer awareness may have some bearing in negating the on-sale bar (where there is at least a proposed transaction between two parties); it would appear to have far less relevance in the context of the public-use bar.

Although the court has attempted to make the law less complex, we are not convinced that this move will suffice given the remoteness of the audience of inventors. We would prefer to see the court focus more of its attention on addressing proximity. The court might begin by dispensing with the fiction that the experimental-negation rules as they currently exist are comprehensible to inventors themselves, or that those rules directly shape *ex ante* incentives in any direct way. This, in turn, would make plain the need to develop better heuristics or other strategies for rendering proximity more favorable.

Overall, unlike the *ex post* considerations of patent scope, the statutory bars need to be accessible to a wide spectrum of inventors if the incentives of the regime are to operate appropriately. While we recognize that the community of innovators may need to tolerate a certain level of complexity in statutory bar rules, we expect that it will be difficult to refine these rules by addressing proximity alone. The public-use bar and the experimental-use negation, while focused on questions of historical fact, might be clarified and simplified in a manner to provide reduce complexity for the relevant audience,<sup>203</sup> even while courts simultaneously strive to address the proximity issue.

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203. Cf. Peter Lee, *Patent Law and the Two Cultures*, 120 Yale L.J. 2, 22–25 (2011) (arguing that lay persons will use heuristics and seek out expert opinions, rather than choose to “wrestle with understanding a complex technology”).

## CONCLUSION

Our goal in this Article is not to propose any monolithic definition of patent law's audience. Instead, our goal is to point out the disconnect between patent law's presumptuous rhetoric about its audience and the reality of the patent system's institutions and communications challenges. Our further goal is to consider approaches to designing patent law doctrines that take into account the disconnect and the challenges.

One design approach requires that those who craft patent doctrine first discard the fallacy that patent law rules are addressed to the general public (or even to inventors), and recognize that virtually all patent law rules are broadcast to and among multiple intermediaries that retransmit (and frequently reformulate) those rules for consumption by generalists. The roles played by these intermediaries, and their place in the design calculus for patent law rules, have not been articulated sufficiently. Intermediaries might impede communication or foster it. They might represent actual persons or institutions, or they might constitute convenient fabrications, such as the PHOSITA, the "reasonable competitor," or the "reasonable patent attorney" heuristics. Regarding the heuristics, a patent law jurisprudence that is attuned to patent law's audience (and the complexity/proximity tradeoff) ought to treat the development of the PHOSITA and other heuristics as a central design task rather than as an afterthought. It should invoke and shape these heuristics much more deliberately. It should also recognize that, for some patent rules, the PHOSITA heuristic alone may be insufficient to improve proximity between the lawmaker and the ultimate audience.

Ultimately, if the patent law is to operationalize its oft-stated concerns with providing "public notice," or with shaping incentives for communities of would-be innovators, then patent rules must be designed with an eye to communicating with these audiences. A sole focus on reducing rule complexity, taking no account of the rule's proximity to its putative audience, is not likely to be productive.