

Fordham Intellectual Property, Media and Entertainment Law Journal

Volume 32 XXXII
Number 4

Article 1

2022

The Patent Medium: Toward a Network Paradigm of the Patent Medium

Or Cohen-Sasson

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The Patent Medium: Toward a Network Paradigm of the Patent Medium

Cover Page Footnote

* LL.M., LL.B., B.Sc.; Research Fellow, Canon Foundation in Europe; Ph.D. Candidate, Zvi Meitar Center, Faculty of Law, Tel Aviv University. I would like to thank Clark Asay, Tamar Ashuri, Michael Birnhack, Daniel Benoliel, Yael Blumstein, Oren Bracha, Karni Chagal, Jorge Contreras, Avihay Dorfman, Rochelle Dreyfuss, Severine Dussolier, Timothy Holbrook, Ariel Katz, Asa Kling, Mark Lemley, Hephzibah Levine, Orit Lissak, Miriam Marcowitz-Bitton, Hisao Shiomi, Tine Sommer, Geertrui Van Overwalle, and Nitzan Wagner. Many thanks to the wonderful Fordham Intellectual Property, Media & Entertainment Law Journal's team for their constructive comments and professional editing work. This research was supported by the Canon Foundation in Europe and ISF Grant No. 537/21.

The Patent Medium: Toward a Network Paradigm of the Patent System

Or Cohen-Sasson*

The modern patent system is conceived of as an information platform; it is evident in the common description of the patent system as a quid-pro-quo bargain: Society grants exclusive rights in exchange for information published by a patentee. But is there more to the patent system than merely informing others? Does the patent system also serve as a communication (and not only information) platform, namely, as a medium? Based on an interdisciplinary analysis of the patent system's structure and features through the lenses of communication studies, this Article suggests that it does. It demonstrates how the patent system—as a medium—enables players to fulfill various communicative ends, much beyond the obvious goal of disseminating legal-technological knowledge. This Article strives to characterize the patent medium, as well as to examine the implications of portraying the patent space as a medium.

Utilizing the power of communication analysis, this Article uncovers an existing, somewhat implicit communication paradigm of the patent system as a medium. Although tacit and unofficial, this paradigm is evident through a critical reading of patent scholarship and case law. This unspoken communication paradigm resembles that of a bulletin board: it is linear, straightforward, and focuses on

* LL.M., LL.B., B.Sc.; Research Fellow, Canon Foundation in Europe; Ph.D. Candidate, Zvi Meitar Center, Faculty of Law, Tel Aviv University. I would like to thank Clark Asay, Tamar Ashuri, Michael Birnhack, Daniel Benoliel, Yael Blumstein, Oren Bracha, Karni Chagal, Jorge Contreras, Avihay Dorfman, Rochelle Dreyfuss, Severine Dussolier, Timothy Holbrook, Ariel Katz, Asa Kling, Mark Lemley, Hephzibah Levine, Orit Lissak, Miriam Marcowitz-Bitton, Hisao Shiomi, Tine Sommer, Geertrui Van Overwalle, and Nitzan Wagner. Many thanks to the wonderful Fordham Intellectual Property, Media & Entertainment Law Journal's team for their constructive comments and professional editing work. This research was supported by the Canon Foundation in Europe and ISF Grant No. 537/21.

the informative value of communication. However, this bulletin-board paradigm does not fully reflect the actual nature of the communication that transpires within the patent medium. After reexamining the patent space—the rules, structure, participants, and practices—this Article offers an alternative, more comprehensive paradigm of the patent medium—the network paradigm. A network, as opposed to a bulletin board, is a connected, multi-directional, and multi-player platform, which allows communication for various ends (including, but not limited to, informing). Instead of viewing the patent medium statically as a host of informative announcements, the network paradigm suggests a dynamic perspective, considering the patent medium to enable discourse.

Beyond its theoretical contribution, the network paradigm serves as a powerful explanatory tool, offering profound implications for patent law. Specifically, the network paradigm resolves current oddities in the patent system; for instance, the network paradigm provides new understandings regarding phenomena in patent law such as patent pledging, early publication, and the first-to-file rule—incidents commonly considered enigmatic or only partially understood. As a tool with theoretical and practical-analytical value, the network paradigm helps both courts and commentators to theorize and rationalize patent law.

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INTRODUCTION

Disseminating information is a fundamental function of the patent system,¹ as has been acknowledged at least since the eighteenth century.² Indeed, rules related to the process of disseminating information comprise a linchpin in current patent law. The informational

¹ See *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc.*, 534 U.S. 124, 142 (2001) (quoting *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974)) (“The disclosure required by the Patent Act is ‘the quid pro quo of the right to exclude.’”); Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 541 (2009) (“[P]atent disclosure indirectly stimulates future innovation by revealing the invention’s design so that others can use it fruitfully when the patent term expires and design around, improve upon, or be inspired by the invention, even during the patent term.”); Jason Rantanen, *Patent Law’s Disclosure Requirement*, 45 LOY. U. CHI. L.J. 369, 370–71 (2013).

² See Edward C. Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 3)*, 77 J. PAT. & TRADEMARK OFF. SOC’Y 771, 777 (1995) (discussing the evolution of specification). See generally Edward Wyndham Hulme, *On the History of the Patent Law in the Seventeenth and Eighteenth Centuries*, 18 L.Q. REV. 280 (1902) (detecting the emergence of the specification practice in the 1730s).

function is most evident in the disclosure requirement and patent claims.³ Hence, it is unsurprising to see extensive literature and case law on patents' informational role.⁴ Scholars, practitioners, and judges have addressed the information that patents reveal, primarily through the official, public patent documents and particularly through the disclosure requirement.

However, the patent system serves beyond merely disseminating information. For instance, patents can stimulate consumer interest and unveil future products;⁵ the patent system can mediate novel scientific achievements to the public⁶ and signal commercial or national dominance;⁷ patents may inform the public about anticipated changes in daily experiences;⁸ or contribute to the climate change discourse.⁹ These functions and many others suggest that patents,

³ See 35 U.S.C. § 112; Or Cohen-Sasson, *A Hidden Technological Assumption in Patent Law*, 22 J. WORLD INTELL. PROP. 272, 283 (2019) (examining the function of the disclosure requirement and pointing out an inherent conflict between the disclosure requirement and big-data-related inventions).

⁴ See Dan L. Burk, *Patent Silences*, 69 VAND. L. REV. 1603, 1607 (2016) (reviewing how academic literature grasps the fundamental role of disclosure); Rantanen, *supra* note 1, at 378–88 (suggesting to view patent disclosure's doctrinal and theoretical aspects jointly, in a holistic view). See generally Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621 (2010) (offering several measures to transform patent disclosures to more readable, teaching documents).

⁵ See, e.g., Henry St. Leger, *This Leaked PS5 Patent Gives Us Our Best Look at the Console Design Yet*, TECHRADAR (Aug. 20, 2019), <https://www.techradar.com/news/this-leaked-ps5-patent-gives-us-our-best-look-at-the-console-design-yet> [<https://perma.cc/GH7C-3EQ7>].

⁶ See, e.g., Stephen Shankland, *Android Will Get an Answer to Apple Airtags. Here's How UWB Location Tech Works*, CNET (Oct. 12, 2021, 9:40 AM), <https://www.cnet.com/news/apple-built-uwb-into-the-iphone-11-heres-what-you-need-to-know-faq/> [<https://perma.cc/H2FR-9RX2>].

⁷ See, e.g., Ariel Cohen, *A Breakthrough in American Energy Dominance? U.S. Navy Patents Compact Fusion Reactor*, FORBES (Oct. 30, 2019, 12:37 PM), <https://www.forbes.com/sites/arielcohen/2019/10/30/a-breakthrough-in-american-energy-dominance-us-navy-patents-compact-fusion-reactor/#748843421070> (last visited Apr. 11, 2022).

⁸ See, e.g., Saavon Smalls, *Recently-Published Patent Suggests Facebook Wants to Include Ads in DMs*, MASHABLE (Aug. 2, 2019), <https://mashable.com/video/facebook-dm-private-ads-patent/> [<https://perma.cc/DST4-CTDU>].

⁹ See, e.g., Stephen Kuper, *Player Two Has Entered the Game: US Navy Files Fusion Reactor Patent*, DEFENCE CONNECT (Nov. 1, 2019), <https://www.defenceconnect.com.au/key-enablers/5064-player-two-has-entered-the-game-us-navy-files-fusion-reactor-patent> [<https://perma.cc/PHE7-PT7R>] (reportedly, based on patent information, the United States Navy pursues and develops clean energy).

and more generally the patent system, assume more than an informational role; they play a *communicative* role.

Although somewhat reminiscent of each other, the informational role and communicative role are not the same.¹⁰ The informational role mainly refers to the patent system's power to convey technical knowledge and notify others about legal restrictions due to a patent issuance. The communicative role refers to use of the patent system to interact with other players by stimulating, misleading, criticizing, and endorsing others. Indeed, communication is a superset that includes the process of informing; however, communicating is a substantially more diverse and complex act than merely informing. Communicating can be highly active, emphasizing not only the knowledge that parties transmit or acquire, but also the interactions between parties and the consequences of such engagements.¹¹

In contrast to the vast extant literature about patents' informational role, their communicative role has been studied only marginally.¹² Moreover, within the thin thread discussing patents' communicative function, most writing has addressed such a function indirectly, lacking a clear theory regarding *patent communication* (i.e., the bundle of various interactions, such as patentee-public or applicant-PTO interactions, within the *patent space*).¹³ The term "patent space" refers to the patent system's various components, including its rules, players, common practices, and related phenomena.¹⁴

This Article strives to fill this gap with two major steps. *First*, this Article exposes an existing, unspoken communication paradigm of the patent system—the *bulletin-board paradigm*. Although the patent system has no official communication paradigm, a close inspection reveals an implicit one. This Article conceptualizes this

¹⁰ See HUNTER WHITNEY, DATA INSIGHTS: NEW WAYS TO VISUALIZE AND MAKE SENSE OF DATA 191 (2012).

¹¹ To elaborate on the informing-communicating distinction, see *infra* Part IV.A.1.

¹² With few notable exceptions, to be discussed later, see generally J. Jonas Anderson, *Nontechnical Disclosure*, 69 VAND. L. REV. 1573 (2016); Clark D. Asay, *The Informational Value of Patents*, 31 BERKELEY TECH. L.J. 259 (2016); Timothy R. Holbrook, *The Expressive Impact of Patents*, 84 WASH. U. L. REV. 573 (2006); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625 (2002).

¹³ See *infra* notes 78–85 and accompanying text.

¹⁴ Such as patent pledging, patent statistics, and patent reviews. For discussion of each respectively, see *infra* notes 157–58, 214, 218–19 and accompanying text.

communication paradigm as a bulletin board, because it is an inventor/applicant-centric paradigm¹⁵ with a linear trajectory, manifested chiefly in one-way information dissemination from a patentee to specific groups. This paradigm focuses on the informational value, rather than the communicative value, of the medium. The paradigm emphasizes the public sphere of communication, whereas private channels (i.e., unpublicized communications) receive insufficient attention. Moreover, it envisions the patent system as a communication platform with relatively few dominant players and limited freedom on the recipients' side in terms of communicative power.¹⁶ In short, the bulletin-board paradigm perceives patents as announcements, disregarding the notion that the patent space is a conversation arena.

Second, instead of the bulletin-board paradigm, this Article offers an alternative communication paradigm—the *network paradigm*. A network suggests a more diverse and nuanced picture than a bulletin board. It recognizes more players within the patent space who are active and influential, acknowledging their diversified communicative power.¹⁷ This paradigm presents an active, multi-directional, and continuous communication process rather than the traditional one-way communication pattern. Moreover, in the context of multi-player communications, the network paradigm acknowledges intermediaries' critical role and incorporates them into the theory. Importantly, the relation between the bulletin-board and network paradigms is not one of contradiction, but of containment: the network paradigm adopts the bulletin-board paradigm's insights, such as the informing function, and offers a more comprehensive

¹⁵ I use both 'inventor' and 'applicant' because an inventor may choose not to submit an application. Such an action could also constitute a powerful communicative act, like Jonas Salk who developed the polio vaccine and chose to not patent it. See generally JANE S. SMITH, *PATENTING THE SUN* (1990) (reviewing the development of the polio vaccine).

¹⁶ Communicative power is the participant's ability to express themselves and influence other participants in a given medium.

¹⁷ Such as active reading or other trivial and non-trivial ways of communication. See Elihu Katz et al., *Utilization of Mass Communication by the Individual*, in *THE USES OF MASS COMMUNICATIONS: CURRENT PERSPECTIVES ON GRATIFICATIONS RESEARCH* 19, 19 (Jay G. Blumler & Elihu Katz eds., 1974); ELIHU KATZ & PAUL F. LAZARSFELD, *PERSONAL INFLUENCE* 32–33 (1955); BARBARA JOHNSTONE, *DISCOURSE ANALYSIS* 1–31, 128–61 (2d ed. 2008); DAN LAUGHEY, *KEY THEMES IN MEDIA THEORY* 23–25 (2007).

communication model that better describes and explains the patent space. Thus, the network paradigm does not reject the bulletin-board paradigm but rather supplements it.

To conduct a comprehensive communication analysis of the patent system, this Article integrates the fundamentals of patent law and communication studies and offers a systematic, organized paradigm of the *patent medium*. The patent medium is a hypothetical apparatus consisting of all communication that transpires—officially and unofficially—in the patent space. Addressing the patent system as a medium—not solely as an economic-legal instrument—reveals a new stratum of the patent system: its communicative function. Communication studies point to an intriguing dissimilarity: the bulletin-board paradigm resembles more basic, meager models of communication—sender-message-channel-receiver (“SMCR”) models or linear models¹⁸—that emerged and were commonly used around the 1960s.¹⁹ In contrast, the network paradigm is closer to the transactional model,²⁰ a later communication model that attained popularity in modern communication studies due to its ability to fit various, complex communications.²¹

Equipped with a new, fine-tuned communication paradigm of the patent system—namely, the network paradigm—this Article advances an explanatory argument arising from the paradigm: the proposed paradigm enables us to better understand and explain a variety of practices and legal rules in patent law. The following discussion elaborates on this argument.

This Article maintains that the network paradigm holds an explanatory power that offers a more comprehensive, thorough, and

¹⁸ DAVID K. BERLO, *THE PROCESS OF COMMUNICATION: AN INTRODUCTION TO THEORY AND PRACTICE* 30–32 (1960); CLAUDE E. SHANNON & WARREN WEAVER, *THE MATHEMATICAL THEORY OF COMMUNICATION* 6–8 (1949).

¹⁹ Robert T. Craig, *Constructing Theories in Communication Research*, in *THEORIES AND MODELS OF COMMUNICATION* 39, 47 (Paul Cobley & Peter J. Schulz eds., 2013).

²⁰ See Dean C. Barnlund, *A Transactional Model of Communication*, in *FOUNDATIONS OF COMMUNICATION THEORY* 83, 85 (Kenneth K. Sereno & C. David Mortensen eds., 1970).

²¹ The Author noted that there is an inclusion relation between the network paradigm and the bulletin-board (i.e., the former includes the latter). This relation remains valid also under the analogy to the linear model and the transactional model, as the linear model is included in the transactional model.

accurate understanding of the patent system than the bulletin-board paradigm. For instance, consider the phenomenon of publishing patent applications before the eighteen-month deadline. Patent law requires publication of a patent application no later than eighteen months from the earliest filing date.²² The patent law's traditional view maintains that publication is against the patentee's interest, who prefers secrecy.²³ In fact, this is the principal issue patent law aspires to overcome—incentivizing publication with economic rights.²⁴ As such, according to the bulletin-board paradigm, applicants are expected to defer publication as much as possible, at least until the issuance of a patent. However, practice reveals that nearly half of applicants demand that the Patent and Trademark Office (“PTO”) publish their application earlier.²⁵ Moreover, more than twenty percent of applicants eligible to opt out of the eighteen-month deadline choose not to do so.²⁶ These practices pose difficulties within the bulletin-board paradigm.

²² 35 U.S.C. § 122(b).

²³ *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 424 (1908) (“[T]o induce a disclosure of it [the invention], Congress has, by its legislation, made in pursuance of the Constitution, guaranteed to him an exclusive right to it for a limited time”); Dale L. Carlson et al., *Patent Linchpin for the 21st Century*, 45 IDEA 267, 271 (2005) (“Two types of benefits flow from a patent grant. First and foremost, the information that the society receives from the disclosure.”); Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123, 126–27 (2006) (“[T]he invention is disclosed instead of being kept a secret.”).

²⁴ See *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 186 (1933) (“[The inventor] may keep his invention secret and reap its fruits indefinitely. In consideration of its disclosure and the consequent benefit to the community, the patent is granted.”); Asay, *supra* note 12, at 270–75 (“[T]raditional patent law theories view these information disclosures as a sacrifice that an inventor must make in order to obtain the real prize of a patent: exclusive rights.”); Mark A. Lemley, *Intellectual Property and Shrinkwrap Licenses*, 68 S. CAL. L. REV. 1239, 1276 (1995) (describing the balance between exclusive rights and disclosed information).

²⁵ See 37 C.F.R. § 1.219 (2008). See also Stephen Glaeser & Wayne R. Landsman, *Deterrent Disclosure*, 96 ACCT. REV. 291, 291 (2021) (“[W]e find that patent applicants . . . voluntarily accelerate their patent disclosures.”); John F. Martin, *The Myth of the 18-Month Delay in Publishing Patent Applications*, IP WATCHDOG (Aug. 3, 2015), <https://www.ipwatchdog.com/2015/08/03/the-myth-of-the-18-month-delay-in-publishing-patent-applications/id=60185/> [<https://perma.cc/YK3B-TCRJ>].

²⁶ Approximately twenty-one percent of applicants that had the right to delay publication beyond the eighteen-month, chose not to do so. This number refers to applicants who file an application in the United States solely, and not abroad; thus, explaining the non-opting-out phenomenon on the basis of a tradeoff with the foreign applications—namely, that applicants prefer to publish within eighteen months and not bear the heavy sacrifice of

On the other hand, the network paradigm offers a proper explanation of early publication: disseminating information is neither the patent system's sole function nor its sole capability. Players, including applicants, use the patent system for other ends, such as expanding collaborations,²⁷ generating buzz,²⁸ and encouraging consumerism.²⁹ The patent system serves not only as a legal platform, but also as a communication network for conducting discourse. The early publication practice, which conflicts with the underlying assumptions of the bulletin-board paradigm, coincides with the network paradigm; publication—and more generally, patent communication—is not (only) a means but an end. Patent communication benefits not only the public but other participants, and in this case, the applicants themselves.

The early publication case is only one example of the network paradigm's inherent potential. This Article cites further examples to demonstrate how the network paradigm explains various practices and legal rules in the patent system, which the bulletin-board paradigm either ignores or only partially explains.

However, an important caveat must be noted. Although the bulletin-board paradigm does not fully capture the patent medium's multiple functions, one should not discount it entirely. The bulletin-board paradigm stems from a deliberate, primary communicative goal of the patent system and the most basic function of the patent medium—to disseminate information.³⁰ However, as a paradigm that originated from a predetermined goal, the bulletin-board paradigm is constrained by this notion. Resultantly, it does not encompass communication that transpires beyond the information dissemination function. The network paradigm aspires to supplement the interspace between the pre-planned and the actual communication of the patent medium by theorizing patent communication more

waiving foreign filing rights—is not a valid account. *See* 37 C.F.R. § 1.213 (2012); Glaeser & Landsman, *supra* note 25, at 23–31.

²⁷ *See* Jorge L. Contreras, *Patent Pledges*, 47 ARIZ. ST. L.J. 543, 573–74 (2015).

²⁸ Stuart J. H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 BERKELEY TECH. L.J. 1063, 1064–70 (2008).

²⁹ *See supra* notes 5–6, 8.

³⁰ *See* J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 142 (2001) (quoting *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974)); Fromer, *supra* note 1; Rantanen, *supra* note 1.

generally, beyond trivial communication processes. Accordingly, the network paradigm does not always conflict with the bulletin-board paradigm. The network paradigm provides a broader, more accurate understanding of the patent system and reveals insights we would miss or improperly perceive if solely relying upon the bulletin-board paradigm. Nonetheless, the two paradigms coincide in certain instances.

This Article is the product of an interdisciplinary inquiry, relying on two pillars: patent law and communication studies. In integrating the two fields, this Article offers a fresh way to contemplate and investigate patent law—as a medium.

This Article proceeds as follows: Part I provides an introduction to patents as artifacts of information and communication, as the extant literature grasps this topic. Part II presents the theoretical foundations from communication studies in which this Article's arguments are rooted. Specifically, Part II discusses the most common communication models and describes the gradual steps that communication theorists have made from linear to transactional models. Part III exposes the current communication paradigm that implicitly governs patent literature and case law—the bulletin-board paradigm. After describing the bulletin-board paradigm's communicative features, Part III demonstrates through three sample phenomena—patent pledges, early publication, and the first-to-file rule—that the bulletin-board paradigm is deficient. Part IV proposes the legislature adopt a new, alternative communication paradigm of the patent medium—the network paradigm. This Article outlines the network paradigm using five communicative elements and elaborates on each through examples from the patent space. The argument maintains that the network paradigm is more than a mere theoretical view; it bears forceful explanatory power and thus has practical implications as well. Part IV substantiates the explanatory argument by applying the network paradigm to the three sample phenomena addressed in Part III. This move underscores the superiority of the network paradigm over the bulletin-board paradigm, thereby further bolstering the suggestion to adopt the network paradigm. Additionally, Part IV supports the shift from the bulletin-board paradigm to the network paradigm by presenting a similar, more general transition that took place in communication studies, as Part II explains,

from linear to transactional models. Finally, it provides a brief conclusion.

I. PATENTS, INFORMATION, AND COMMUNICATION

This Part discusses how current literature grasps the ternary interplay of patents-information-communication. Commonly, (modern) patent law is described as a social contract: a patent encompasses a pact between the public and the patentee³¹ in which the public bestows the patentee exclusive, fixed-term rights concerning an invention, and in exchange, the patentee discloses novel, innovative information.³² Therefore, extensive literature has addressed patents as a source of information (i.e., *patent information*), focusing on specific types of content or audiences.³³ The disclosure requirement is a focal motif in such literature. The disclosure doctrine demands that a patentee describes her invention and its utilization.³⁴ Later, this information becomes public; thus, disclosure is the

³¹ See *Grant v. Raymond*, 31 U.S. 218, 219 (1832) (“The third section [of the 1793 Act] requires, as preliminary to a patent, a correct specification . . . in order to give the public, after the privilege shall expire, the advantage for which the privilege is allowed, and is the foundation of the power to issue the patent.”); *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 186 (1933); *Eldred v. Ashcroft*, 537 U.S. 186, 224 (2003) (Stevens, J., dissenting) (“Complete disclosure as a precondition to the issuance of a patent is part of the *quid pro quo* that justifies the limited monopoly for the inventor as consideration for full and immediate access by the public when the limited time expires.”); Oren Bracha, *Geniuses and Owners: The Construction of Inventors and the Emergence of American Intellectual Property*, in *TRANSFORMATIONS IN AMERICAN LEGAL HISTORY* 369, 380 (Daniel W. Hamilton & Alfred L. Brophy eds., 2009).

³² See 35 U.S.C. § 102(a).

³³ See generally Annamaria Conti et al., *Show Me the Right Stuff: Signals for High-Tech Startups*, 22 J. ECON. & MGMT. STRATEGY 341 (2013) (arguing that startups use patents to attract business angel and venture capital funds); see also Mark D. Janis & Timothy R. Holbrook, *Patent Law's Audience*, 97 MINN. L. REV. 72, 75 (2012); Lisa L. Ouellette, *Who Reads Patents?*, 35 NATURE BIOTECH. 421, 421 (2017) (focusing on the scientific community as an audience).

³⁴ See 35 U.S.C. § 112; *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1328 (Fed. Cir. 2000) (invalidating a patent which was not supported by sufficient written description); Brenda M. Simon, *Patent Cover-Up*, 47 HOUS. L. REV. 1299, 1318 (2011) (“To satisfy the disclosure requirements for patent protection, an inventor must provide a written description of the invention and enable one of ordinary skill in the art to make and use the invention.”).

primary instrument for disseminating information regarding a patented invention.

The disclosure requirement underscores the patent system's *informational* function. Two domains—the scientific-technical and the legal—comprise the core of patent information scholarship.³⁵ Scientific-technical information relates to a fundamental goal of the patent system—disseminating new technological information.³⁶ Hence, explaining patents as carriers of scientific-technical information is familiar.³⁷ As utility-oriented documents,³⁸ patents serve, at least in some fields, as a useful resource both for scientists and down-stream inventors.³⁹ The question of why scientists and inventors use patent information has various answers: in some cases,

³⁵ See Timothy R. Holbrook, *Patents, Presumptions, and Public Notice*, 86 IND. L.J. 779, 779 (2011) (discussing the “Janus-like” nature of patent documents as conveying both technical and legal information and elaborating on the complications it causes).

³⁶ Paul M. Janicke, *Patent Disclosure: Some Problems and Current Developments*, 53 J. PAT. OFF. SOC'Y 3, 3–5 (1971) (“Another obvious objective of the patent system is to get technical information to the public”); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 287–88 (1977); Seymore, *supra* note 4, at 621; Simon, *supra* note 34, at 1317.

³⁷ For a similar observation, see generally Jane Kaye et al., *Patents and Translational Research in Genomics*, 25 NATURE BIOTECH. 739 (2007); Ouellette, *supra* note 33; K. M. Saunderson, *Patents as a Source of Technical Information*, 24 ASLIB PROC. 244 (1974); Richard D. Walker, *Patents as Information—An Unused Resource*, 10 IFLA J. 175, 175 (1984); RICHARD D. WALKER, PATENTS AS SCIENTIFIC AND TECHNICAL LITERATURE (1995).

³⁸ See U.S. CONST. art. I, § 8, cl. 8 (“[T]o promote the Progress of Science and useful Arts”); 35 U.S.C. § 101.

³⁹ See Wolfgang Glänzel & Martin Meyer, *Patents Cited in the Scientific Literature: An Exploratory Study of ‘Reverse’ Citation Relations*, 58 SCIENTOMETRICS 415, 415 (2003) (finding that about thirty thousand U.S. patents were cited by scientific research papers during 1996–2000); Devrim Göktepe-Hulten & Prashanth Mahagaonkar, *Inventing and Patenting Activities of Scientists: In the Expectation of Money or Reputation?*, 35 J. TECH. TRANSFER 401, 401 (2010) (suggesting that scientists use patents to gain reputation). See also FELIX LIEBESNY ET AL., THE SCIENTIFIC AND TECHNICAL INFORMATION CONTAINED IN PATENT SPECIFICATIONS (1973) (finding that only about six percent of technological information in UK Patents also exists in non-patent literature; when the information is available both inside and outside patent documents, patents are usually the first source in print to include disseminate it); WALKER, *supra* note 37, at xi–xii, 1–60; Alice Lam, *What Motivates Academic Scientists to Engage in Research Commercialization: ‘Gold’, ‘Ribbon’ or ‘Puzzle’?*, 40 RSCH. POL'Y 1354, 1354 (2011); Lisa L. Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. 545, 546 (2012) (arguing that the benefits of disclosure are stronger than is generally believed and that patents contain technical information that is not available elsewhere); Ouellette, *supra* note 33; Walker, *Patents as Information—an Unused Resource*, *supra* note 37, at 175–77.

patents contain information not yet published; thus, such information is inaccessible outside the patent system.⁴⁰ Additionally, patent documents present technical topics in a broad, thorough manner, often more so than other sources.⁴¹ Hence, patent documents facilitate bridging gaps between different disciplines.⁴²

The second domain is that of legal information. Using patent documents for legal purposes is straightforward: patent documents describe the scope of a patented invention to inform the public which actions are excluded and which are available for practice.⁴³ The patent claims,⁴⁴ when read with the disclosure,⁴⁵ delineate the patent's proper borders.

However, patents can do more than merely inform; one can discern some *communicative* aspects in the context of the patent system. Only sparse literature has addressed the communicative aspects of patents, relative to the considerable literature regarding patent information.⁴⁶ Indeed, informing is a subset of communicating; however, communicating is a much broader and potent activity.⁴⁷ Merely informing another is basic, low-level communication. As Sydney Harris observed, “[i]nformation is giving out;

⁴⁰ See WALKER, *supra* note 37, at 41 (“[T]he patent specification is the first public disclosure of such an innovation.”). See generally H. R. Mathys, *Patents as a Source of Information*, 4 ASLIB PROC. 69, 73 (1952); Ouellette, *supra* note 39; P. James Terragno, *Patents as Technical Literature*, 22 IEEE TRANSACTIONS ON PRO. COMM’N 101, 101–02 (1979) (citing studies that demonstrate that patents contain information that is not disclosed elsewhere).

⁴¹ See LIEBESNY et al., *supra* note 39; Ouellette, *supra* note 39; Terragno, *supra* note 40, at 101 (“[Patents] are different from journal literature in that they are stand-alone documents and have a uniformity of presentation.”).

⁴² See JOHN S. GILMORE ET AL., NASA CR-790, THE CHANNELS OF TECHNOLOGY ACQUISITION IN COMMERCIAL FIRMS, AND THE NASA DISSEMINATION PROGRAM 1–2 (1967).

⁴³ See *Magsil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1380–81 (Fed. Cir. 2012). This role is also referred to as commensurability. See CRAIG A. NARD, *THE LAW OF PATENTS* 87 (2008).

⁴⁴ See 35 U.S.C. § 112(b).

⁴⁵ See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (“[T]he first paragraph requires that the specification describe the invention set forth in the claims.”).

⁴⁶ See Anderson, *supra* note 12; Asay, *supra* note 12; Long, *supra* note 12.

⁴⁷ See WHITNEY, *supra* note 10 and accompanying text.

communication is getting through.”⁴⁸ When informing, one simply disseminates data in a standardized manner, while in communicating, the emphasis is on active participation in the design, delivery, or interpretation of a message. Put differently, communication means to engage, not only inform.

Few legal scholars have examined issues regarding patent communication. The following discussion notes some major works consistent with this theme. Clarisa Long’s article, *Patent Signals*, is seminal work on patent communication.⁴⁹ Long offers a perspective on patents as economic signals. She argues that patents serve as relatively cheap, credible signals.⁵⁰ She explains the capacity of patents to deliver economic signals and demonstrates this phenomenon through economic models.⁵¹ Since Long focuses on patents’ potential to convey messages of economic significance, *Patent Signals* focuses on the way that patents communicate to economic audiences, such as competitors and investors.⁵²

Using patents as economic signals is fascinating and non-trivial, as patent documents do not contain detailed financial prospects (e.g., a revenue forecast).⁵³ Patents, in and of themselves, do not promise the commercialization or success of an invention. In fact, many patented inventions are not commercialized.⁵⁴ Yet, patents are a

⁴⁸ *Id.* at 191.

⁴⁹ Long, *supra* note 12.

⁵⁰ *See id.* at 625.

⁵¹ *See id.* at 643–64.

⁵² *See id.* at 643–58.

⁵³ For a discussion of what an inventor must submit as part of a patent application, see WALKER, *supra* note 37, at 176.

⁵⁴ Robert P. Morgan et al., *Patenting and Invention Activity of U.S. Scientists and Engineers in the Academic Sector: Comparisons with Industry*, 26 J. TECH. TRANSFER 173, 178 (2001) (finding that patents in the industry sector had a commercialization rate of 48.9% and patents in the academic sector had a commercialization rate of 33.5%); Kurt M. Saunders, *Patent Nonuse and the Role of Public Interest as a Deterrent to Technology Suppression*, 15 HARV. J.L. & TECH. 389, 391 (2002) (“[A]pproximately forty to ninety percent of issued patents are not used or licensed by the patentee.”); Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 362–64 (2010) (arguing, in accordance with empirical findings, that less than half of all patented product inventions are commercialized); Elizabeth Webster & Paul H. Jensen, *Do Patents Matter for Commercialization?*, 54 J.L. & ECON. 431, 436 (2011) (finding that the number of inventions that were granted a patent and then went on to seek mass production is about forty-one percent).

common way to communicate economic signals.⁵⁵ Patents' signaling function derives from two key aspects. First, patents provide exclusive economic rights, potentially increasing the market value of patent-owning entities.⁵⁶ Second, as patents are granted for novel inventions, they comprise ostensible evidence of innovation.⁵⁷ The reported number of owned patents is a clear example: the more patents a patentee holds, the more innovative she is deemed to be.⁵⁸

Following Long's article, other, non-legal studies have investigated patents as economic signals. Specifically, scholars inspected the relations between patents and entities' market values.⁵⁹ Patents increase the price paid during mergers and acquisitions and bankruptcy proceedings, leading to the recognition that patents play a role in determining and signaling an entity's market value.⁶⁰

Within this context, patents' impact on patentee-investor relationships has been studied intensively. Patent signals improve chances of securing an investment,⁶¹ as can be observed in the

⁵⁵ See Long, *supra* note 12, at 643–64.

⁵⁶ See IAIN M. COCKBURN & REBECCA HENDERSON, SURVEY RESULTS FROM THE 2003 INTELLECTUAL PROPERTY OWNERS ASSOCIATION SURVEY ON STRATEGIC MANAGEMENT OF INTELLECTUAL PROPERTY C.2 (Oct. 2003); William W. Fisher III & Felix Oberholzer-Gee, *Strategic Management of Intellectual Property: An Integrated Approach*, 55 CAL. MGMT. REV. 157, 158 (2013).

⁵⁷ See Ann Bartow, *Separating Marketing Innovation from Actual Invention: A Proposal for a New, Improved, Lighter, and Better-Tasting Form of Patent Protection*, 4 J. SMALL & EMERGING BUS. L. 1, 1 (2000) (arguing that patents aid patentees in appearing more innovative); Sharon Belenzon & Andrea Pataconi, *Innovation and Firm Value: An Investigation of the Changing Role of Patents, 1985-2007*, 42 RSCH. POL'Y 1496, 1496 (2013) (finding that EPO patents are the dominant indicator of innovative activity).

⁵⁸ See Bartow, *supra* note 57, at 8–9 (noting that companies may invest in research and development with the goal of accumulating patents, generating an appearance of innovation, and increasing company valuations).

⁵⁹ See, e.g., Dirk Czarnitzki et al., *Patents as Quality Signals? The Implications for Financing Constraints on R&D* (Nat'l Bureau of Econ. Rsch., Working Paper No. 19947, 2014) (studying the effects of firms' patenting activity on the degree of financing constraints).

⁶⁰ See Gregory L. Alexander, *Don't Overlook Patent Damages*, 16 AM. BANKER INST. J. 26 (1997); Robert Boyden Lamb, *The Role of Intellectual Property and Intangible Assets in Mergers and Acquisitions*, in INTELLECTUAL PROPERTY ASSETS IN MERGERS AND ACQUISITIONS 2.1, 2.3–2.5 (Lanning G. Bryer & Melvin Seminsky eds., 2002) (arguing that firms' IP has become a major factor in valuing mergers and acquisitions deals).

⁶¹ See David H. Hsu & Rosemarie H. Ziedonis, *Patents as Quality Signals for Entrepreneurial Ventures*, ACAD. MGMT. BEST PAPER PROC. 1, 2 (2006),

relationship between patentees and venture capitals (“VCs”).⁶² Patent signals in patentee-investor relationships are not constrained to privately-held companies; a similar signaling capability can be identified in initial public offerings (“IPO”).⁶³ Empirical studies have indicated that patents enhance a company’s reputation before an IPO, leading to “IPO patents” that lure investors.⁶⁴ A peculiar phenomenon underscores the signaling quality of patents in IPOs; namely, that shortly after an IPO’s conclusion, companies that go public have been known to abandon many of their IPO patents.⁶⁵

Two other important works, alongside Long’s article, join the thread of patent communication: *The Informational Value of Patents* by Clark Asay⁶⁶ and *Nontechnical Disclosure* by Jonas Anderson.⁶⁷ From a legal perspective, both articles deal with a non-trivial usage of the patent system—its capability to convey messages beyond the obvious legal and technical information context. Moreover, both papers build on the groundwork Long set approximately fifteen-years

<https://faculty.wharton.upenn.edu/wp-content/uploads/2015/07/11.pdf>

[<https://perma.cc/94KS-8SJX>] (finding that patents improve the terms by which new firms access VCs); Mark A. Lemley, *Reconceiving Patents in the Age of Venture Capital*, 4 J. SMALL & EMERGING BUS. L. 137, 143–44 (2000) (arguing that patents may serve other purposes besides excluding competitors, including improving the chances to secure VCs’ investment); Long, *supra* note 12, at 637.

⁶² See Conti et al., *supra* note 33, at 356; Daniel Hoenig & Joachim Henkel, *Quality Signals? The Role of Patents, Alliances, and Team Experience in Venture Capital Financing*, 44 RSCH. POL’Y 1049, 1050–53 (2015) (finding that patents affect the venture capitalists’ decision making); Annamaria Conti et al., *Patents as Signals for Startup Financing*, 61 J. INDUS. ECON. 592, 593 (2013) (demonstrating how startup founders file for patents to signal invention quality to VCs).

⁶³ See Graham & Sichelman, *supra* note 28, at 1067.

⁶⁴ See, e.g., Diego Usech, *Are Patents Signals for the IPO Market? An EU-US Comparison for the Software Industry*, 43 RSCH. POL’Y 1299, 1299 (2014) (finding correlation between patent applications and IPO performance).

⁶⁵ See Nada Basir et al., *The Fate of Patents: An Exploratory Analysis of Patents as IPO Signals of Reputational Advantage* 5 (Royal Inst. of Tech., Ctr. of Excellence for Sci. and Innovation Stud., Working Paper No. 348, 2014) (finding correlation “between the likelihood of patents expiring due to lack of maintenance fee payments and the time to IPO”).

⁶⁶ Asay, *supra* note 12; see also Clark D. Asay, *The Informational Effects of Patent Pledges*, in PATENT PLEDGES 227 (Jorge L. Contreras & Meredith Jacob eds., 2017).

⁶⁷ Anderson, *supra* note 12.

prior.⁶⁸ Yet, these works highlight aspects with which Long did not engage and apply the general idea of signaling theory to concrete cases in patent law.⁶⁹

Asay addressed the communicative function in the specific context of patent pledges. In short, “pledging” means waiving patent rights fully or partially.⁷⁰ By waiving patent rights, pledgers intend to deliver various messages about themselves to competitors, investors, and potential partners and employees.⁷¹ Asay convincingly argues that it is more credible and beneficial to convey messages by waiving rights granted by a patent, rather than avoiding the process of applying for a patent in the first place or relinquishing trade secrets.⁷²

Anderson, on the other hand, focuses not on pledges but on the disclosure requirement.⁷³ Although Anderson does not explicitly use the term communication, he contends that patent disclosure is a way to communicate with investors.⁷⁴ Anderson expands the term “investors” to also include consumers, not just shareholders and VCs who may find interest in a product due to patent disclosure.⁷⁵ The argument and its result concur with many of the aforementioned works that discuss the power of patents to attract investors.⁷⁶ However, while most researchers investigated the topic from an economic perspective, Anderson’s article adds a legal point of view, as he juxtaposes nontechnical disclosure with the traditional disclosure doctrine and analyzes the former through a patent theory lens.⁷⁷

⁶⁸ See *id.* at 1592 (“Long signaling theory is a valuable insight”); Asay, *supra* note 12, at 265 n.27 (“This Article thus builds on Long’s work while identifying key differences with it.”).

⁶⁹ See Asay, *supra* note 12, at 309–20 (providing an overview of recent Supreme Court patent decisions, and ramifications for patents as informational tools).

⁷⁰ *Id.* at 261.

⁷¹ See *id.* at 286–307.

⁷² See *id.* at 282–85.

⁷³ Anderson, *supra* note 12, at 1577.

⁷⁴ See *id.* at 1575.

⁷⁵ See *id.*

⁷⁶ See *supra* notes 59–65 and accompanying text.

⁷⁷ See Anderson, *supra* note 12, at 1599 (discussing the nuances of patent theory and nontechnical disclosure).

The works discussed thus far address a specific function of patents—the communicating function—and suggest that patents serve goals beyond the basic aims of protecting inventions and disseminating information. Such an approach resembles the general notion underlying this Article. However, there are gaps and deficiencies in the literature which this Article aims to resolve. First, extant works have not addressed the communication framework of the patent system *per se*. Scholars have focused on the capability to convey messages through patents in particular contexts. For instance, Long and Anderson have discussed patent disclosure, specifically in the investing sphere, and Asay has focused on pledges.⁷⁸ More generally, although some works have acknowledged the patent system's communicative power, none thoroughly delineate the theoretical foundations, structure, or overall framework of patent communication. Establishing such a framework is one of this Article's goals.

Second, although current literature directly or indirectly addresses patents' communicative power, such works do not harness the potent power that lies within communication studies. Most scholars address the communicative function only from patent law and economic perspectives. To properly comprehend the multitude ways in which the patent medium operates, one must utilize an interdisciplinary approach and apply tools and insights from communication studies. No literature to date has applied the prism of communication studies to investigate patent communication. This Article relies on both patent law and communication studies, offering a thorough consideration of patent communication that rests on theoretical foundations of both relevant fields.

Third, the literature thus far has depicted the patent medium as consisting of a sender and a recipient—an inventor/patentee⁷⁹ on one end, and (mainly) investors and competitors on the other. However, the scholarship has not considered the role of intermediaries.⁸⁰

⁷⁸ See Asay, *supra* note 12.

⁷⁹ Note, that the inventor is not always the assignee, yet in some cases the law requires it to include the inventor's name. See 35 U.S.C. § 115(a); Pre-AIA 35 U.S.C. § 102.

⁸⁰ Janis and Holbrook did discuss the importance of intermediaries, though their focus was on the legal aspect rather than the communicative aspect. They mainly argued that the intermediation process aids bridging the law to others, and more generally, making the law more accessible. Whereas their argument is related to the current Article, here I consider

For instance, Anderson refers to nontechnical disclosure as if the public reads patent documents as a trivial matter,⁸¹ whereas such an assumption is far-fetched. Resolving this gap is quite simple using the concept of intermediation. Intermediaries comprise an essential element in most communication systems,⁸² and patent communication is no exception. Various intermediaries operate in the context of the patent medium; this includes patent agents and attorneys, PTOs, journalists, innovation analysts, salespeople, government agencies, and political entities. This Article's interdisciplinary research incorporating communication studies into patent scholarship introduces key elements of communication—specifically, the intermediation process, which is inherent to the patent medium.

Finally, most scholarship views patents as conveying one-way messages under the senders' control and underestimates the power of recipients. For instance, Long and Anderson have focused on disclosure, a one-sided communicative deed conducted and controlled by applicants.⁸³ Disclosure is indeed a critical step in the patent medium; however, patent communication is much broader than the disclosure requirement alone. Put differently, patents generate a unique conversation between parties, beyond the informative announcements that patentees deliver through disclosure.⁸⁴ This reality underscores an additional point: patentees are dominant players, but they are not the only players—others influence the message, including recipients.⁸⁵ Indeed, patent disclosure, albeit important, is not the only message in patent communication.

intermediaries in a much broader way, beyond the straightforward aspect of explaining rules. See Janis & Holbrook, *supra* note 33, at 75, 86–88 (“[P]atent law could operate more effectively if it . . . devised pragmatic mechanisms—intermediaries—to bridge the distance between formal patent law rules and the targeted audience for those rules.”).

⁸¹ See Anderson, *supra* note 12, at 1577 (discussing public disclosure).

⁸² See KATZ & LAZARSFELD, *supra* note 17.

⁸³ See Amanda F. Myers et al., *The USPTO Patent Assignment Dataset: Descriptions and Analysis* (USPTO, Working Paper No. 2015-2).

⁸⁴ See *supra* notes 5–9 and accompanying text. Also, consider instances such as patent reviews, the early publication practice, the patent continuation practice, cross-licensing, patent pools, and standard-essential patents. Later, this Article elaborates on some of these examples.

⁸⁵ See Katz et al., *supra* note 17. For elaboration, see *infra* Part IV.A.3 for a discussion regarding patent reviews and the continuation practice.

Although existing literature appears to allude to this Article's general argument, the points made herein expose significant inter-spaces in the present understanding of patent communication. This Article fills these gaps and clarifies misconceptions. Using both patent law and communication studies, this Article formulates a broad and well-founded communication paradigm of the patent medium. Such a paradigm will enable stakeholders to better understand and explain the patent system.

II. THE EVOLUTION OF COMMUNICATION MODELS: FROM LINEAR TO TRANSACTIONAL MODELS

This Part introduces fundamental concepts in information and communication theories that serve as building blocks for later Parts of this Article. This Part introduces the most common communication models: the linear model, the interactional model, and the transactional model.⁸⁶ It portrays the gradual progress from the basic, linear model to the more comprehensive transactional model.

Communication comprises the transmission of messages between parties. In its most basic form, communication involves a sender (or speaker), recipient (or listener), and information. However, most communication processes are more complex.⁸⁷ Communication can occur directly or indirectly, intentionally or unintentionally, implicitly or explicitly, synchronously or asynchronously, within an intimate group of friends or among innumerable strangers.

The major players who participate in communication processes are the senders, recipients, and intermediaries.⁸⁸ The sender is the one who initiates a message.⁸⁹ The sender encodes the message and relays it to recipients.⁹⁰ Traditional notions of sending involve

⁸⁶ See generally KATZ & LAZARSFELD, *supra* note 17, at 31–42, 309–21; SHANNON & WEAVER, *supra* note 18, at 6–8.

⁸⁷ See DENIS MCQUAIL, *MCQUAIL'S MASS COMMUNICATION THEORY* 13–35 (6th ed. 2010); Manuel Castells, *Communication, Power and Counter-Power in the Network Society*, 1 INT'L J. COMMUN. 238, 246–52 (2007) (describing the complex, networked nature of the current communication space).

⁸⁸ JOHNSTONE, *supra* note 17, at 128–61; MCQUAIL, *supra* note 87.

⁸⁹ MCQUAIL, *supra* note 87, at 83–84.

⁹⁰ *Id.*

speaking and writing, but many other actions can be used to deliver a message, such as gesturing.⁹¹

The recipient is the message's destination.⁹² A recipient decodes the sender's message, attempting to understand what the message means.⁹³ Early communication models underestimated the power of recipients and their capability to influence a communication process.⁹⁴ Indeed, the term "recipient" implies passivity. However, in practice, a recipient holds significant power, which is no less important than that of the sender. For a communication process to succeed, both the sender and the recipient must engage; namely, by playing an active role.⁹⁵

The intermediary is an entity that serves as a bridge from the sender to possible recipients.⁹⁶ At times, multiple intermediaries are involved, especially in our global, branched, and digital culture.⁹⁷ The intermediation process is particularly significant in communication theory.⁹⁸ Intermediaries execute essential communicative actions, such as regulating, editing, and republishing.⁹⁹ Moreover, they are prevalent in various communicative events, such as in formulating, distributing, and commentating on a message.¹⁰⁰

The classical communication models are rooted in these basic notions.¹⁰¹ In 1948, mathematician and engineer Claude Shannon published a paper that established a new research field: information

⁹¹ *Id.*

⁹² *Id.*

⁹³ See generally Claude E. Shannon, *A Mathematical Theory of Communication*, 27 BELL SYS. TECH. J. 379, 379 (1948).

⁹⁴ See *id.* at 381 fig.1.

⁹⁵ UMBERTO ECO, *ROLE OF THE READER* 3–43, 49 (1979) (“... each individual addressee can refashion the original composition devised by the author. The addressee is bound to enter into an interplay of stimulus and response which depends on his unique capacity for sensitive reception of the piece.”).

⁹⁶ See Davis Foulger, *Roles In Media*, Presentation at DIAC-02 Shaping the Network Society (May 18, 2002), <http://davis.foulger.info/presentations/rolesInMedia.htm> [<https://perma.cc/PY6X-BWCE>].

⁹⁷ See JAN HARRIS & PAUL TAYLOR, *DIGITAL MATTERS: THE THEORY AND CULTURE OF THE MATRIX* 175–92 (2005); KATZ & LAZARFELD, *supra* note 17, at 128–61.

⁹⁸ See KATZ & LAZARFELD, *supra* note 17; LAUGHEY, *supra* note 17, at 23–25.

⁹⁹ See KATZ & LAZARFELD, *supra* note 17; LAUGHEY, *supra* note 17, at 23–25.

¹⁰⁰ KATZ & LAZARFELD, *supra* note 17, at 1, 32–33; LAUGHEY, *supra* note 17, at 23–25.

¹⁰¹ See KATZ & LAZARFELD, *supra* note 17; LAUGHEY, *supra* note 17, at 23–25.

theory.¹⁰² In brief, information theory studies the measurement, quantification, transmission, and storage of information.¹⁰³ Shannon introduced a well-structured communication model comprised of several components: information source, transmitter, channel, receiver, and destination.¹⁰⁴ When these elements are placed in sequence, communication transpires.¹⁰⁵ A source sends a message encoded in the form of a signal and transmitted over a communication channel to a receiver who decodes the signal back into a message that eventually arrives at a destination.¹⁰⁶ Shannon's paper drew considerable attention from communication theorists,¹⁰⁷ who, like information theorists, engage with information transmission, but with very different tools typically emerging from disciplines such as sociology, anthropology, philosophy, and psychology.¹⁰⁸ Shannon and Warren Weaver published a book that made Shannon's model more accessible to non-mathematicians.¹⁰⁹

The Shannon-Weaver model is *linear*.¹¹⁰ It conceives of communication as a one-way process, in which the sender is the sole, dominant, active player.¹¹¹ Despite its significant contribution to

¹⁰² See Sergio Verdu, *Fifty Years of Shannon Theory*, 44 IEEE TRANSACTIONS ON INFO. THEORY 2057, 2057 (1998) (“Shannon’s discovery of the fundamental laws of data compression and transmission marks the birth of Information Theory.”).

¹⁰³ See Aleksandra Karolak et al., *Concepts and Applications of Information Theory to Immuno-Oncology*, 7 TRENDS IN CANCER 335, 336 (2021) (“Information Theory (IT) describes and quantifies information storage and communication in a mathematically rigorous fashion.”).

¹⁰⁴ See Shannon, *supra* note 93, at 380–82.

¹⁰⁵ See *id.* at 381 fig.1.

¹⁰⁶ See *id.*

¹⁰⁷ See JOHN FISKE, INTRODUCTION TO COMMUNICATION STUDIES 6 (1982).

¹⁰⁸ See BERLO, *supra* note 18, at *Preface*.

¹⁰⁹ See generally SHANNON & WEAVER, *supra* note 18.

¹¹⁰ Daniel Chandler, *The Transmission Model of Communication*, UWA, <http://visual-memory.co.uk/daniel/Documents/short/trans.html> [<https://perma.cc/DLA4-E4Z5>] (Dec. 9, 2020, 8:16 PM).

¹¹¹ Li Hong Ling, *From Shannon-Weaver to Boisot: A Review on the Research of Knowledge Transfer Model*, in 2007 INTERNATIONAL CONFERENCE ON WIRELESS COMMUNICATIONS, NETWORKING AND MOBILE COMPUTING 5439, 5439 (2007) (“The transfer direction can not be reversed and there is no information feedback either.”); Yingnan Yang & Yanfei Jiang, *Research on the Impacts of BIM on Information Exchange Between Stakeholders in Construction Project*, in 6th INTERNATIONAL CONFERENCE ON ELECTRONICS, MECHANICS, CULTURE AND MEDICINE 520, 529 (2015) (“That is, it [the Shannon-Weaver model] is still just a one-way linear transmission without feedback.”).

communication theory, later studies pointed to a shortcoming in the Shannon-Weaver model: the linear model did not capture all the fundamental features of a communication process.¹¹² For instance, intermediation is not part of this model. Elements in this model that somewhat resemble the notion of intermediation are very meager and technical, addressing only the electrical aspect of intermediation—specifically, noise that impairs information quality throughout its journey from a sender to a recipient.¹¹³ Another limitation of the Shannon-Weaver model is the distinction between communication sessions.¹¹⁴ Each session transpires independently as if it has a known, fixed time window occurring independently, absent any context.¹¹⁵

In general, three notable underlying assumptions are particularly problematic in the Shannon-Weaver model: (1) recipients are assumed to be passive players; (2) communication is limited to one message per one recipient; and (3) the communication process is viewed as having precise beginning and ending points.¹¹⁶ The linear model's simplicity, which makes it elegant and instructive, also limits its scope.

Communication theorists proceeded to develop more complex models. Wilbur Schramm was the first to move in this direction, offering the *interactional model* in 1954,¹¹⁷ which contributed the principle of the feedback layer. Schramm's model portrayed communication as a two-way or circular interaction.¹¹⁸ Feedback covers important events transpiring during a communication process, such

¹¹² MCQUAIL, *supra* note 87, at 85–86, 96.

¹¹³ Noise can be any unwanted disturbance in an electrical signal. Naturally, such a disturbance may affect the sending, receiving, or understanding of a message. In contemporary communication studies, the term noise has expanded to include all kind of unwanted disturbances, not only electrical ones. SHANNON & WEAVER, *supra* note 18, at 5.

¹¹⁴ MCQUAIL, *supra* note 87, at 84.

¹¹⁵ The *context* or *frames of reference* element was introduced later by Schramm. See Schramm, *infra* note 118, at 30–34.

¹¹⁶ See *supra* notes 111–14.

¹¹⁷ See Wilbur L. Schramm, *How Communication Works*, in *THE PROCESS AND EFFECTS OF MASS COMMUNICATION* 3, 6 (Wilbur L. Schramm ed., 1st ed. 1954).

¹¹⁸ Wilbur L. Schramm, *The Nature of Communication Between Humans*, in *THE PROCESS AND EFFECTS OF MASS COMMUNICATION* 3, 23–27 (Wilbur L. Schramm ed., rev. ed. 1971).

as gauging reception, understanding, and reactions.¹¹⁹ The interactional model introduced two essential elements: (1) the communication context—the setting in which communication takes place—as a factor affecting a message; and (2) the field of experience, which refers to the background and culture of the communicators and in turn influences the encoding and decoding of messages.¹²⁰ However, like the Shannon-Weaver model, the interactional model fails to provide a full account of communication. For instance, the interactional model made some progress in depicting senders and recipients as engaged in a back-and-forth interchange, rather than conveying messages independently.¹²¹ However, this model did not cover the idea of parallel communications; that is, communication processes that transpire simultaneously.

In 1970, Dean Barnlund proposed an improved model—the *transactional model*.¹²² His most significant innovation was simultaneity. As its name implies, this model likens communication to a transaction: communication is an interactive, simultaneous game in which participants play together because their interests overlap.¹²³ While the interactional model describes communication as a turn-based process, the transactional model describes multiple, parallel lines of exchanging messages simultaneously.¹²⁴ The transactional model highlights the role of recipients and intermediaries.¹²⁵ Studies have shown that recipients are not weak, passive players but rather play a substantial, active role.¹²⁶ Similarly, scholars recognize the influence intermediaries have over communications, underscoring that the communication process is not a sender-centric game.¹²⁷ Figure 1 below summarizes the three classical models:

¹¹⁹ See Edward J. Downes & Sally J. McMillan, *Defining Interactivity: A Qualitative Identification of Key Dimensions*, 2 *NEW MEDIA & SOC'Y* 157, 158 (2000).

¹²⁰ See Schramm, *supra* note 118, at 31–32 (“The similarity of meaning which Mr. A and Mr. B will perceive in a message depends on finding an area where the experience of the two people is sufficiently similar that they can share the same signs efficiently.”).

¹²¹ See *id.* at 26–34 and accompanying figures and explanations.

¹²² See Barnlund, *supra* note 20, at 85.

¹²³ See *id.* at 87–88.

¹²⁴ See *id.* at 90–91, 95.

¹²⁵ See *id.* at 85 (underscoring the importance of interpretation in communications).

¹²⁶ See ECO, *supra* note 95; Charles J. Fillmore, *Ideal Readers and Real Readers*, in *ANALYZING DISCOURSE: TEXT AND TALK* 248, 248 (Deborah Tannen ed., 1982).

¹²⁷ See JOHNSTONE, *supra* note 17, at 1–31, 128–61; LAUGHEY, *supra* note 17, at 23–25.

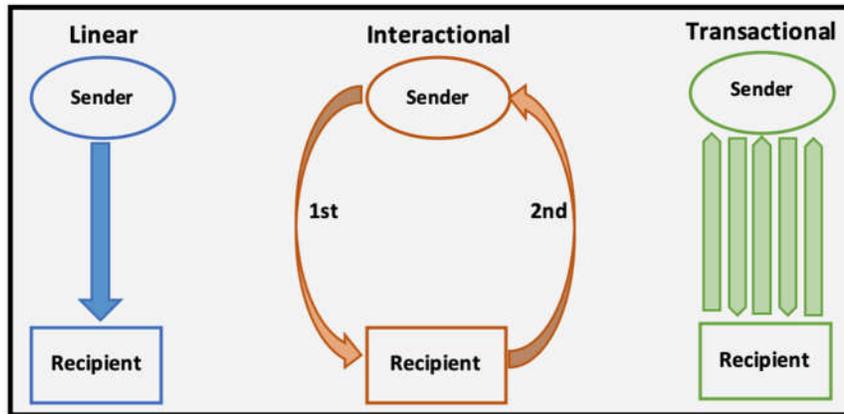


Figure 1: Three classical communication models

In distinguishing between the linear and transactional models, it is important to note that linear models conceive of communication as a one-way channel, whereas transactional models describe communication as a conversation. Thus, players' communicative roles in the transactional model are not static; senders become recipients (and vice versa) and intermediaries shift positions from recipients to interpreters. This dynamic process seems to characterize a conversation rather than a one-way dissemination stream.¹²⁸

Compared to the linear and interactional models, the transactional model is more sophisticated and stratified. Indeed, the transactional model is the most comprehensive and fine-tuned communication model. It includes all major components of previous models and introduces important, new ingredients. Despite its complexity, the transactional model is very popular amid scholars because of its systematic approach.¹²⁹ Over fifty years since its inception, the

¹²⁸ KATZ & LAZARFELD, *supra* note 17.

¹²⁹ In the last twenty years, scholars cited Barnlund's work roughly 570 times. See GOOGLE, https://scholar.google.com/scholar?hl=iw&as_sdt=2005&scioldt=0%2C5&cites=11668844379260767561&scipsc=&as_ylo=2002&as_yhi= (last visited May 10, 2022). Many of these studies relied on the transactional model as a valuable, relevant model of communication. See, e.g., Harmanpreet Kaur et al., *Interpreting Interpretability: Understanding Data Scientists' Use of Interpretability Tools for Machine Learning*, in PROCEEDINGS OF THE 2020 CHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS, Paper 92, at 10 (2020); Doris M. Merkl-Davies & Niamh M. Brennan, *A Theoretical Framework of External Accounting Communication: Research Perspectives, Traditions,*

transactional model still draws researchers' attention, serving as the theoretical foundation for many studies.¹³⁰

The gradual progress from a linear model to a transactional one was necessary to fully comprehend communication processes. A static paradigm, as reflected in the linear model, does not reflect the real nature of communication; to accomplish profound and broad comprehension, communication theorists had to capture the dynamic nature of the phenomenon in their models. Later, this Article argues that a similar shift must occur in the context of the patent medium. Namely, to fully understand patent communication—and generally, the patent system—we should advance from a static, linear paradigm to a dynamic, transactional one.

III. THE CURRENT MINDSET OF PATENT COMMUNICATION: THE BULLETIN-BOARD PARADIGM AND ITS DEFICIENCIES

This Part addresses the existing conception of the patent medium and problems with its conception. Section A reveals a tacit communication mindset that currently resides in patent scholarship and case law, which this Article entitles the *bulletin-board paradigm*. Although the bulletin-board paradigm offers substantial value, Section B shows that this paradigm does not provide a full comprehension of patent communication. This Article uses three phenomena to demonstrate how and why the bulletin-board paradigm fails: (1) patent pledges, (2) early publication, and (3) the first-to-file rule.

and Theories, 30 ACCT., AUDITING & ACCOUNTABILITY J. 433, 463 (2017) (“the transactional model of communication is particularly useful, as it emphasizes the relational and conversational component of communication.”); Julius C. Pham et al., *What to Do with Healthcare Incident Reporting Systems*, 27 J. PUB. HEALTH RES. 154, 157 (2013). In 2008, Barnlund’s work was republished in a special edition. Dean C. Barnlund, *A Transactional Model of Communication*, in COMMUNICATION THEORY 47 (C. David Mortensen ed., 2008).

¹³⁰ See, e.g., Andrew M. Baker et al., *Investigating How Word-of-Mouth Conversations About Brands Influence Purchase and Retransmission Intentions*, 53 J. MKTG. RSCH. 225, 226 (2016); W. Barnett Pearce & Stewart M. Sharp, *Self-Disclosing Communication*, 23 J. COMM’N 409, 410 (1973); Eduardo Salas et al., *Understanding and Improving Teamwork in Organizations: A Scientifically Based Practical Guide*, 54 HUM. RES. MGMT 599, 607 (2015).

A. *The Patent Medium as a Bulletin Board*

This Section presents the paradigm governing patent communication's current perception. This Article refers to this undeclared (yet present) mindset as the bulletin-board paradigm, because the communication process it suggests resembles the act of posting informative notes on a public message board. In many respects, this paradigm corresponds to the linear model of communication. Whereas this paradigm provides some insights regarding patent communication, this Article argues that it falls short of presenting the complete picture.

To begin, this Section describes five elements comprising the bulletin-board paradigm and anchors each to trends and approaches evident in academic literature and case law.

1. Informing

The first element is a focus on informing rather than communicating. As Part I indicated, when commentators discuss patent communication, they focus on a patent's content, particularly the information disclosed about the invention.¹³¹ For them, the communicative value of patents boils down to the informational aspect, with a strong, almost-exclusive emphasis on the disclosure requirement.¹³² Another example that highlights the current mindset is case law and literature's focus on prior art as an informative component.¹³³ Prior art constitutes all information publicly available before the filing date of a patent application—including other patents and patent

¹³¹ See *Eldred v. Ashcroft*, 537 U.S. 186, 224 (2003); *W.L. Gore Assocs., Inc., v. Garlock, Inc.*, 721 F.2d 1540, 1554 (Fed. Cir. 1983); *Fromer*, *supra* note 1; *Rantanen*, *supra* note 1; *Seymore*, *supra* note 4.

¹³² See *Integra Lifesciences I, Ltd. v. Merck KGaA*, 331 F.3d 860, 873 (Fed. Cir. 2003) (“The purpose of a patent system . . . serves to add to the body of published scientific/technologic knowledge.”); *Anderson*, *supra* note 12, at 1585 (“[A]ccording to disclosure theorists, the patent system can be justified by how much information it brings to the public that otherwise would be private.”).

¹³³ See *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17 (1966) (setting the underlying factual determinations to be made when examining whether prior art should lead to the legal conclusion of invalidity); Christopher A. Cotropia & David L. Schwartz, *The Hidden Value of Abandoned Applications to the Patent System*, 61 B.C. L. REV. 2809, 2815–33 (2020) (discussing the informational value of published (including abandoned) patent applications as prior art, specifically for patent examiners).

applications—which may be used to determine novelty and non-obviousness of subject matter.¹³⁴ Put differently, prior art delineates what content is no longer considered new or sufficiently inventive to be patented. Like the disclosure requirement, prior art serves an informational role.¹³⁵

The spotlight on the informing function, rather than the communicating function, fits the patent system’s principal goal—disseminating novel knowledge in exchange for exclusive rights.¹³⁶ Numerous articles and abundant case law address patents as information distributors, but hardly study the communicative aspect.¹³⁷ Indeed, the organizing principle of this approach is dissemination, not communication. Recall that informing and communicating share some common features but are different functions.¹³⁸

2. Linearity

Patent communication’s current conception is a one-way communication channel. Information passes from the patentee to others without reply. Even the social pact metaphor, which is widely applied to the patent system, reflects communication linearity in the patent system: patentees exchange novel, innovative information for the right to exclusivity.¹³⁹ The current perception of patent communication disregards other communication channels that diverge from the usual patentee-to-public channel.¹⁴⁰ Therefore, this approach

¹³⁴ 35 U.S.C. § 102. For a discussion about secret prior art, see Part IV.B.2.

¹³⁵ For elaboration on the relationship between patent disclosure and its status as prior art, see generally Timothy R. Holbrook, *The Written Description Gap*, 45 LOY. U. CHI. L.J. 345 (2013).

¹³⁶ See sources cited *supra* note 1.

¹³⁷ See sources cited *supra* note 12.

¹³⁸ See *supra* notes 10, 48 and accompanying text.

¹³⁹ Bracha, *supra* note 31, at 380 (“[A] system for securing property in the products of genius, is a mutual contract between the inventor and the public.” (alteration in original)); Shubha Ghosh, *Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor After Eldred*, 19 BERKELEY TECH. L.J. 1315, 1315–21 (2004) (“[D]isclosure [of an invention] is ‘the price paid for the exclusivity secured.’”); Sean B. Seymore, *Symposium: The Disclosure Function of the Patent System*, 69 VAND. L. REV. 1455, 1455 (2016) (“[I]n exchange for the right to exclude, the inventor must fully disclose the technical details of the invention.”).

¹⁴⁰ See Part IV.A.1.–2.

views patent communication as limited to what a patentee broadcasts to a receiver, with the issue of recipient feedback overlooked.

There exist incidents of reverse-direction action—meaning, action from the public toward a patentee. For instance, when a party challenges a patent, such an act comprises the public’s reaction to a patentee.¹⁴¹ However, research surrounding these cases has not focused on the communicative context, even though they offer much to explore on the communicative level. Instead, studies focus on legal or economic aspects, such as reforms in the reexamination proceedings or manners in which oppositions affect market strategy.¹⁴²

3. Sender-Centric Perspective

The third element is the dominance of the inventor/applicant in patent communication. Namely, the current view of patent communication perceives the inventor/applicant as the dominant player in patent communication.¹⁴³ The applicant formulates the communication and chooses what to disclose, as well as when and how to disclose it. No other players—and specifically not the public—are party to this act. Indeed, this dominance is not absolute. Some legal rules impose limits on the applicant’s dominance, from a communication perspective, the applicant remains the most powerful player within the patent space—for example, drawing standards¹⁴⁴ and rejection of claims¹⁴⁵ influence the content, structure, and presentation of patent documents. Accordingly, this Article does not contend that

¹⁴¹ For a discussion regarding GMO patents, Myriad’s BRCA patents, and the Chakrabarty case, see *infra* notes 198–205 and accompanying text.

¹⁴² See Greg H. Gardella & Emily A. Berger, *United States Reexamination Procedures: Recent Trends, Strategies and Impact on Patent Practice*, 8 J. MARSHALL REV. INTELL. PROP. L. 381, 381 (2009) (describing strategies and dynamics between infringers and patentees due to the reexamination system); Raymond A. Mercado, *The Use and Abuse of Patent Reexamination: Sham Petitioning Before the USPTO*, 12 COLUM. SCI. & TECH. L. REV. 92 (2011) (exploring ways in which reexamination is vulnerable to abuse, through closely looking at prominent instances, and offering solutions to curb such an abuse); Wayne B. Paugh, *The Betrayal of Patent Reexamination: An Alternative to Litigation, Not a Supplement*, 19 FED. CIR. BAR J. 177, 192–204 (2009) (reviewing the reexamination statute, statutory revisions, and judicial decisions related to the reexamination system and contemplating their consequences).

¹⁴³ See *supra* note 15.

¹⁴⁴ 37 C.F.R. § 1.84 (2020).

¹⁴⁵ *Id.* § 1.104(c).

the current paradigm views the applicant as holding absolute or exclusive control over the process. Rather, it argues that the bulletin-board paradigm holds the applicant to be the most dominant player, while overlooking other players' substantial restraints and important roles.

4. Publicity

The present conception of patent communication is oriented toward communication that transpires in the public sphere—primarily via the disclosure requirement.¹⁴⁶ However, alongside the public sphere, other private, sometimes confidential spheres are evident, such as patent licensing, patent settlements, and patent applicant-attorney communications—all of which occur in private settings.¹⁴⁷ Such non-public communication flies under the current paradigm's radar.¹⁴⁸

Importantly, this Article does not argue that all patent communications be public. Some media, including the patent medium, allow participants to communicate with each other along various

¹⁴⁶ See sources cited *supra* note 34.

¹⁴⁷ *In re Spalding Sports Worldwide Inc.*, 203 F.3d 800 (Fed. Cir. 2000) (ruling that if a record is prepared and submitted primarily for the purpose of legal advice or services (e.g., validating patentability or submitting a patent application), it is privileged in its entirety); Mark A. Lemley & Nathan Myhrvold, *How to Make a Patent Market*, 36 HOFSTRA L. REV. 257, 257 (2007) (arguing that due to the confidentiality of patent licenses, players must navigate through a “blind” market, and therefore, buyers and sellers often miss each other); Mark R. Patterson, *Confidentiality in Patent Dispute Resolution: Antitrust Implications*, 93 WASH. L. REV. 827, 835–41 (2018) (discussing the competitive implications of confidentiality in patent dispute resolution, particularly arbitration and the FRAND context).

¹⁴⁸ Some scholars have discussed indirectly private channels of patent licenses and patent settlements; however, there is no substantial consideration of their communicative quality. See generally, e.g., Megan M. La Belle, *Against Settlement of (Some) Patent Cases*, 67 VAND. L. REV. 375 (2014) (addressing problems created by patent settlements, especially that settlement allows potentially invalid patents to remain in force in contravention of the public good. La Belle argues that settlement is not the best way to resolve all patent disputes from a social welfare perspective, and proposes that trial judges serve as protectors of the public interest); Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. U. L. REV. 115 (2015) (arguing that the use of licenses to measure reasonable royalty damages leads to significant problems: courts rely on private information, it is an ineluctably circular measure, and it incentivizes patentees to distort licenses' value).

degrees of access.¹⁴⁹ However, this Article does argue that we are inclined to disregard the communicative value of non-public channels, resulting in misconceptions about patent communication.¹⁵⁰

5. Few Players

The current comprehension of patent communication primarily focuses on a single protagonist (the applicant) and two deuteragonists (the public and the PTO).¹⁵¹ The current, thin communication approach neglects to account for the communicative value of various players in the patent medium, such as patent agents, patent attorneys, licensees, legal parties, countries, tech-fans, and journalists, despite their significance in the communication context.¹⁵² Even when contemplating the courts' or patent attorneys' actions, the current mindset perceives of these actions as technical-legal functions and not communicative ones.

* * *

Jointly, the five elements comprise a communication paradigm that resembles a bulletin board: it is public and linear—namely, it is accessible to all and directed from senders to recipients. The essence of a message on a bulletin board is the content, and the communication arena consists of limited types of participants—the advertisers, the public, and perhaps even advertising agents. The advertiser is the dominant, active player, whereas the remaining two—particularly the public—are relatively passive participants.

Factors outside the limited scope of the bulletin-board paradigm, such as interactions between the applicant and patent agent, licensing issues, or the information in file wrappers,¹⁵³ are inherent to the

¹⁴⁹ For instance, public communications such as the disclosure requirement and private communications such as patent licenses. *See supra* notes 146–47.

¹⁵⁰ One exception to this publicity-oriented mindset is the PTO-applicant communication. It is a semi-public channel (i.e., the file-wrapper is available in some cases on the Patent Application Information Retrieval (“PAIR”) system), defined by norms held in patent law, such as duty of disclosure, candor, and good faith. *See* 37 C.F.R. § 1.56(a) (2020).

¹⁵¹ Specifically, subgroups of the public, such as competitors, investors, inventors, and scientists. *See supra* Part I.

¹⁵² *See* sources cited *supra* notes 5–9.

¹⁵³ File wrapper is a written record of correspondences between the PTO and an applicant regarding a patent application, preceding the issuance of the patent.

patent space. Notably, extant scholarship and case law are not blind to these factors.¹⁵⁴ However, when courts or scholars perceive of the patent system through the prism of the bulletin-board paradigm, their ability to unpack the communicative significance and role of such factors is limited.¹⁵⁵ The reason for such limitation is that the bulletin-board paradigm does not consider these factors as bearing communicative value but instead focuses on their legal or economic implications.¹⁵⁶

B. Deficiencies of the Bulletin-Board Paradigm

This Section argues that the bulletin-board paradigm fails, at least partially, in providing a comprehensive, convincing explanation of patent communication. This Article points to weak spots in the bulletin-board paradigm and underscores its difficulty to properly cope with various phenomena within the patent space. To demonstrate this failure, the following Section utilizes three sample phenomena in the following order: (1) patent pledging, (2) the early publication practice, and (3) the first-to-file (“FTF”) rule. The rationale behind choosing these sample phenomena is the patent lifecycle; to cover the whole patent lifecycle, this Article divides the patent timeline into three major phases and analyzes one phenomenon for each of the phases. The *post-grant phase* includes issues arising after the PTO grants a patent (e.g., patent pledging). The *pre-grant phase* includes issues emerging after an individual applies for a patent but before it is granted (e.g., early publication). The *pre-examination phase* involves issues regarding the justifications behind bestowing patents (e.g., the FTF rule). The three phenomena demonstrate problems with the bulletin-board paradigm, each regarding its respective phase.

1. Patent Pledging

Patent pledges are promises by patentees not to enforce their patents under certain conditions.¹⁵⁷ Pledging is a growing trend, with

¹⁵⁴ See sources cited *supra* notes 5–9.

¹⁵⁵ See sources cited *supra* notes 5–9.

¹⁵⁶ See sources cited *supra* notes 5–9.

¹⁵⁷ See Jorge L. Contreras & Meredith Jacob, *Introduction*, in *PATENT PLEDGES* 1, 1–4 (Jorge L. Contreras & Meredith Jacob eds., 2017).

top firms pledging their patents.¹⁵⁸ Moreover, this trend has intensified during the COVID-19 pandemic, as leading firms like Moderna pledged their patents.¹⁵⁹ Attempts to explain pledges through the bulletin-board paradigm face three significant difficulties. First, the bulletin-board paradigm only acknowledges patent communication that takes place in official documents, primarily through patent disclosures.¹⁶⁰ However, patentees publish pledges independently, most often on the internet, apart from the official patent documentation.¹⁶¹ As artifacts that are external to the formal patent channel, they remain overlooked and outside the scope of the bulletin-board paradigm.

Second, pledging is a type of communication that is entirely voluntary, as the act exceeds the disclosure requirement imposed by the patent bargain.¹⁶² Thus, one may ask why a patentee would bother to disclose something not required, particularly if such a step involves waiving potent rights? The bulletin-board paradigm maintains that patent communication transpires only due to an obligation; therefore, the paradigm fails to cope with pledging.

Third, the bulletin-board paradigm holds that the dissemination of patent information is designated for the public's benefit.¹⁶³

¹⁵⁸ See *Open Patent Non-Assertion Pledge*, GOOGLE, <https://www.google.com/patents/opnpledge/pledge/> [<https://perma.cc/GVW6-7GD8>]; *Open Specification Promise*, MICROSOFT (2007), https://docs.microsoft.com/en-us/openspecs/dev_center/ms-devcentlp/1c24c7c8-28b0-4ce1-a47d-95fe1ff504bc [<https://perma.cc/Y6YH-VC53>]; Elon Musk, *All Our Patent Are Belong to You*, TESLA (2014), <https://www.tesla.com/blog/all-our-patent-are-belong-you> [<https://perma.cc/R3MR-UHMU>].

¹⁵⁹ See *Statement by Moderna on Intellectual Property Matters During the COVID-19 Pandemic*, MODERNA, <https://investors.modernatx.com/news-releases/news-release-details/statement-moderna-intellectual-property-matters-during-covid-19> [<https://perma.cc/GE8B-2X8Y>]; *The Pledgors*, OPEN COVID PLEDGE, <https://opencovidpledge.org/partners/> [<https://perma.cc/B3VN-6ZVU>]. For a comprehensive review of this phenomenon during the COVID-19 pandemic, see Jorge L. Contreras, *The Open COVID Pledge: Design, Implementation and Preliminary Assessment of an Intellectual Property Commons*, 2021 UTAH L. REV. (forthcoming 2021).

¹⁶⁰ See *supra* notes 131–38, 146–50 and accompanying text.

¹⁶¹ See *supra* notes 158–59. Contreras has proposed to incorporate pledges into the official patent record, see Jorge L. Contreras, *A Registry for Patent Pledges*, in *PATENT PLEDGES* 290, 290 (Jorge L. Contreras & Meredith Jacob eds., 2017).

¹⁶² See *supra* note 139.

¹⁶³ See *supra* note 131.

However, pledging a patent—whatever the purpose¹⁶⁴—benefits both sides, primarily the patentee.¹⁶⁵ This must be the case, since pledging is a voluntary act and waiving patent rights for nothing would be illogical and detached from the realities of the business world.¹⁶⁶ Thus, the bulletin-board paradigm leaves questions unanswered regarding the reason for pledges and their communicative role.

2. Early Publication

U.S. patent law requires publication of a patent application no later than eighteen months from its filing date.¹⁶⁷ Yet, practice reveals an intriguing phenomenon: approximately half of applicants request that the PTO publish their application earlier.¹⁶⁸ Moreover, U.S. patent law allows applicants who waived foreign filing rights to opt out of the eighteen-month deadline, so an application is entitled to a further period of secrecy before its publication.¹⁶⁹ Interestingly, scholars have found that twenty-one percent of applicants that were eligible to opt out of the eighteen-month deadline chose not to do so.¹⁷⁰ Importantly, the twenty-one percent figure refers to applicants who filed an application in the United States solely, and not abroad.¹⁷¹ This explains the non-opting-out phenomenon on the

¹⁶⁴ There are four main categories: inducement, collective action, voluntary restraint, or philanthropic (or public relations). *See* Contreras, *supra* note 27, at 593.

¹⁶⁵ *See* Jonas F. Ehrnsperger & Frank Tietze, *Motives for Patent Pledges: A Qualitative Study* (Univ. of Cambridge Ctr. for Tech. Mgmt., Working Paper No. 2019/11) (“We found . . . the primary motive [of patent pledging] being ‘Driving Technology Diffusion.’”); Liza Vertinsky, *Hidden Costs of Free Patents*, 78 OHIO ST. L.J. 1379, 1379 (2017) (arguing that patent pledges may enhance patent hold-up, foreclosing alternative technology paths, and creating entry barriers).

¹⁶⁶ There is a commercial reason even in so-called altruism, such as in implementing corporate social responsibility. *See, e.g.,* Camelia-Daniela Hategan et al., *Doing Well or Doing Good: The Relationship Between Corporate Social Responsibility and Profit in Romanian Companies*, 10 SUSTAINABILITY 1041 (2018) (finding that companies which implement CSR activities in a greater extent are more profitable in economic terms).

¹⁶⁷ *See supra* note 22.

¹⁶⁸ *See supra* note 25.

¹⁶⁹ *See* 37 C.F.R. § 1.213 (2012). Opting out is limited to cases in which “the invention disclosed in an application has not been and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing.” *Id.*

¹⁷⁰ *See* sources cited *supra* note 26.

¹⁷¹ *See* Glaeser & Landsman, *supra* note 25, at 296.

basis of a tradeoff with the foreign applications—namely, that applicants prefer to publish within eighteen months and not bear the heavy sacrifice of waiving foreign filing rights¹⁷²—is not a valid account.¹⁷³ Moreover, note that early publication and the no opt-out option neither confers patent rights nor expedites the examination process.

Efforts to explain this practice using the bulletin-board paradigm face two major obstacles. First, the bulletin-board paradigm maintains that publication is merely a means to obtain the applicant's interest—patent rights.¹⁷⁴ In fact, commentators perceive such publication as a sacrifice on the part of applicants against their interests, which patent law aims to solve by incentivizing disclosure.¹⁷⁵ Hence, one might expect applicants to try disclosing as little information as possible and defer disclosing to the greatest extent possible (at the least until the patent is granted).¹⁷⁶ However, reality proves otherwise; not only do applicants generally not opt out of the eighteen-month deadline, but many seek to publish earlier.¹⁷⁷ Applying the bulletin-board paradigm leads to a counterintuitive conclusion, whereby applicants appear to be acting against their own interests.

Second, the bulletin-board paradigm assumes that publication has a unilateral purpose—to inform the public regarding technical and legal issues.¹⁷⁸ Thus, publishing an application should serve this goal. However, recall that at the early publication stage, an application is still under examination.¹⁷⁹ Namely, the PTO has not approved the technical and legal significance of the application.¹⁸⁰ Therefore, such information does not fulfill the traditional communicative goal

¹⁷² *See id.*

¹⁷³ *See supra* note 26 and accompanying text.

¹⁷⁴ As, according to the traditional view, information disclosure is an instrumental action, done to secure patent rights. *See* sources cited *supra* notes 131–37 and accompanying text.

¹⁷⁵ *See* Holbrook, *supra* note 23, at 126–27.

¹⁷⁶ *See* Cohen-Sasson, *supra* note 3, at 274.

¹⁷⁷ The early publication practice is even more surprising, since deferring the deadline may exempt applicants from publication in the future (e.g., due to rejection of an application or abandoning it).

¹⁷⁸ *See supra* note 131.

¹⁷⁹ *See supra* note 22.

¹⁸⁰ 35 U.S.C. § 131.

of the patent system; thus, there is no reason to publish this information before it is relevant (i.e., the PTO should not approve early publication). Nevertheless, early publication is a common, official practice in patent law.¹⁸¹

3. First-to-File Rule

After decades of heated debate,¹⁸² the America Invents Act (“AIA”) transitioned the American patent system from a first-to-invent (“FTI”) system to a FTF system.¹⁸³ In brief, the FTI regime held an inventor eligible for a patent if the individual was first to invent (i.e., conceived of the invention first and diligently reduced it to practice).¹⁸⁴ The FTF system instructs that the right to patent an invention lies with the first inventor to file the patent application, regardless of the invention date.¹⁸⁵

To justify the FTF reform, commentators have raised, *inter alia*, communication-related arguments (though they did not use this

¹⁸¹ See Glaeser & Landsman, *supra* note 25.

¹⁸² See S. Doc. No. 90-5 (1967); Charles L. Gholz, *First-to-File or First-to-Invent?*, 82 J. PAT. & TRADEMARK OFF. SOC’Y 891, 892 (2000) (arguing for the FTF rule reform); Charles R. B. Macedo, *First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 18 AIPLA Q.J. 193, 197 (1990) (reviewing the advantages and disadvantages of adopting the FTF rule); Rebecca C. E. McFadyen, *The “First-to-File” Patent System: Why Adoption Is Not an Option!*, 14 RICH. J.L. & TECH. 1, 61 (2007) (arguing against the FTF reform because it may lead to “irreparable harm to American innovation”); Andrew L. Sharp, *Misguided Patent Reform: The Questionable Constitutionality of First-to-File*, 84 U. COLO. L. REV. 1227, 1227 (2013) (asserting that the FTF rule violates two Constitutional provisions).

¹⁸³ The American patent system is not identical to the traditional FTF rule. See Mark A. Lemley, *Does Public Use Mean the Same Thing It Did Last Year?*, 93 TEX L. REV. 1119 (2015) (“ . . . (under the American FTF-like rule), unlike many other countries, inventors can also satisfy the obligation to share the invention with the world by making a ‘public disclosure’ such as a publication or a public sale; doing so gives the inventor a year to get her invention on file.”); Tara Rachinsky et al., *First-to-Invent Versus First-to-File: Impact of the AIA*, 3 PHARM. PAT. ANALYST 353 (2014) (“The biggest difference is one of the [one]-year safe harbor for public disclosures of an invention. The rest of the world still has a rule of absolute priority with no safe harbor or a very narrow window ([six] months as opposed to [one] year in the U[nited] S[tates]).”).

¹⁸⁴ See Pre-AIA 35 U.S.C. § 102(g); *Amgen, Inc. v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200, 1205–06 (Fed. Cir. 1991).

¹⁸⁵ See Pre-AIA 35 U.S.C. § 102(g); *Amgen*, 927 F.2d at 1205–06; 35 U.S.C. § 102(b)(1). A caveat is due: there is a protection against derivation. The first-to-file applicant loses if they derived the invention from someone else.

terminology explicitly). One argument cited the incentive disclosure early.¹⁸⁶ FTF makes the filing date crucial; therefore, inventors would apply for a patent sooner and consequently, information would be available earlier to further advance innovation.¹⁸⁷ This argument coincides with the bulletin-board paradigm, which advocates the value of patents' informing function—the sooner, the better.¹⁸⁸

However, applying the bulletin-board paradigm to the FTF regime fails to explain one issue—the changes that FTF made for participants other than the public.¹⁸⁹ The bulletin-board paradigm underscores the communicative contribution of the FTF reform for recipients in the patent space; that is, expediting the arrival of patent information to the public.¹⁹⁰ But what are the communicative implications of the FTF reform from other participants' perspectives? For instance, from the perspective of (potential) senders? From PTOs? What about from other participants in the patent space?

IV. A NEW, PREFERABLE COMMUNICATION PARADIGM: THE PATENT MEDIUM AS A NETWORK

This Part aims to formulate a new, alternative communication paradigm of patent communication: the *network paradigm*. Section A defines the network paradigm and characterizes it through five features. Whereas the bulletin-board paradigm reflects the linear communication model, this Section indicates how the network paradigm resembles the transactional model. Therefore, the network paradigm offers a more comprehensive approach toward the patent medium. Section B again summons the three sample phenomena discussed above¹⁹¹ to demonstrate the superiority of the network paradigm over the bulletin-board paradigm. Therefore, this Section suggests adopting the network paradigm as a more holistic outlook

¹⁸⁶ See Gholz, *supra* note 182, at 895.

¹⁸⁷ See *id.*; President's Commission, *supra* note 182, at 3, 6.

¹⁸⁸ See *supra* notes 131–38 and accompanying text.

¹⁸⁹ Namely, the advantages of expedited disclosures outside the trivial context of legal-technical informing.

¹⁹⁰ See Gholz, *supra* note 182, at 895.

¹⁹¹ See *supra* Part III.B.

for the patent medium. This proposal—calling for progress from the bulletin-board paradigm to the network paradigm—resembles and is inspired by the broader move in communication studies from a simple, linear model to a branched, transactional model.

A. *The Network Paradigm*

This Section offers a new communication paradigm of the patent medium—the network paradigm. It introduces five communicative elements of the network paradigm and juxtaposes each with the respective feature in the bulletin-board paradigm. Note that the network paradigm does not reject the benefits provided by the bulletin-board paradigm; instead, the network paradigm constitutes a more comprehensive framework, containing the insights of the bulletin-board paradigm but not limited to its paradigmatic borders.

1. “The What”: The Communicating Function

The bulletin-board paradigm analysis underscores that the primary use of the patent medium is to inform others, chiefly through patent disclosure.¹⁹² Under the network paradigm, however, the focus is on communicating. Instead of merely informing others about novel inventions and legal constraints, the patent medium facilitates various types of communicative ends: critique, public relations, debating, brainstorming, misleading, establishing or substantiating a community, and much more.¹⁹³ Moreover, one communicative act in the patent medium can serve multiple purposes. A patent text can fulfill a certain goal toward the PTO (e.g., proving novelty in the legal sense),¹⁹⁴ another goal vis-à-vis consumers (by sensing their

¹⁹² See sourced cited *supra* notes 131–38 and accompanying text.

¹⁹³ See Alan Friedman, *Apple’s Latest Patent Application Is Related to an Accessory We Could See Early Next Year*, PHONEARENA (Oct. 17, 2019, 4:26 PM), https://www.phonearena.com/news/New-patent-appliated-filed-for-Apple-Tags_id119762 [<https://perma.cc/ZHV3-8YG5>]; GIZMOCHINA, *Patents*, <https://www.gizmochina.com/?s=patents> (last visited Apr. 11, 2022); PATENTLY APPLE, <https://www.patentlyapple.com/> [<https://perma.cc/Z2GQ-B2P2>]; PATENTLY MOBILE, <https://www.patentlymobile.com/> [<https://perma.cc/55J6-K975>]; Michael Zhang, *Canon Designed a Crazy 50-80mm f/1.1 Lens*, PETAPIXEL (Aug. 10, 2019), <https://petapixel.com/2019/08/10/canon-designed-a-50-80mm-f-1-1-lens/> [<https://perma.cc/E5TC-K2GB>]. See also sources cited *supra* notes 5–9 and accompanying text.

¹⁹⁴ 35 U.S.C. §§ 112–113.

reception of a possible innovation¹⁹⁵), and an entirely different goal toward competitors (such as contouring a territory of technological dominance).¹⁹⁶ Another example of how communicative acts have multiple goals is a patent pledge, through which a patentee can both improve public relations and signal willingness to collaborate.¹⁹⁷

Other examples include patent challenges and patent oppositions. Alongside its legal purpose, the act of opposing a patent application or challenging a patent can serve as a social activism tool; for example, three bold, illustrative cases are the opposition against Monsanto's patent application for a GMO melon,¹⁹⁸ the dystopian and ethical arguments in *Diamond v. Chakrabarty*,¹⁹⁹ and the challenging of Myriad's BRCA patents.²⁰⁰ *Molecular Pathology v. Myriad Genetics* offers a particularly interesting example of how patent

¹⁹⁵ See Anderson, *supra* note 12, at 1575–77.

¹⁹⁶ Sharon D. James, *The Use of Voluntary Public Disclosure and Patent Strategies to Capture Value from Product Innovation*, 16 J. APPLIED BUS. & ECON. 11, 11 (2014); Silvan Berg et al., *Identifying First Signals of Emerging Dominance in a Technological Innovation System: A Novel Approach Based on Patents*, 146 TECH. FORECASTING & SOC. CHANGE 706, 708 (2019).

¹⁹⁷ See JONATHAN BARNETT, INNOVATORS, FIRMS, AND MARKETS: THE ORGANIZATIONAL LOGIC OF INTELLECTUAL PROPERTY xiv (2021) (arguing that patents enable upstream firms that specialize in innovation to exchange informational assets with downstream firms that specialize in commercialization, thus facilitating collaboration by lowering costs and technical barriers); Asay, *supra* note 12, at 299, 306–07; Contreras, *supra* note 27, at 593.

¹⁹⁸ See E.U. Patent No. EP1962578B1 (filed Dec. 21, 2006); Gargi Parsai, *Opposition to Monsanto Patent on Indian Melons*, HINDU (Feb. 5, 2012, 2:49 AM), <https://www.thehindu.com/news/national/opposition-to-monsanto-patent-on-indian-melons/article2861063.ece> [<https://perma.cc/Q57U-EHGT>].

¹⁹⁹ See *Diamond v. Chakrabarty*, 447 U.S. 303, 318 (1980) (holding that a living, man-made micro-organism is patentable subject matter under the Patent Act of 1952). For elaboration on such arguments in this case, see generally Brief for Peoples Business Commission as Amicus Curiae Supporting Petitioner, *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (No. 79-136); Jorge L. Contreras, *Narratives of Gene Patenting*, 43 FLA. ST. U. L. REV. 1133, 1165–69 (2016) (detecting and analyzing six narratives in gene patenting: the Science, Innovator, Administrative, Access, Dystopian, and Congestion narrative. Contreras demonstrates the Dystopian Narrative through the *Diamond v. Chakrabarty* case).

²⁰⁰ See *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 582 (2013); Michael Crichton, *What's Wrong with Patenting Genes?*, Address to Congressional Aides (Sept. 2006), <http://www.whoownsyourbody.org/crichton-congress.html> [<https://perma.cc/6BQP-Y9Z6>]; *The Fight to Take Back Our Genes*, ACLU, <https://www.aclu.org/issues/privacy-technology/medical-and-genetic-privacy/fight-take-back-our-genes?redirect=fight-take-back-our-genes> [<https://perma.cc/FTZ5-UJVM>].

challenging serves as an act of social activism.²⁰¹ *Myriad* addressed questions regarding gene patenting.²⁰² Throughout the case, many activists and patients were eager to express their views, and their assertions consisted of more than just legal arguments. They raised ideas around human dignity, patient rights, access to healthcare, anti-commodification of the human genome, and scientific freedom—issues rooted in moral philosophy and political sociology, not patent law.²⁰³ Moreover, one of the two parties that filed the action is the American Civil Liberties Union (“ACLU”), a prominent activism organization, which referred to *Myriad* as a “fight to take back our genes.”²⁰⁴ The *Myriad* case attracted much public attention: the media obsessively and extensively covered the case as an issue of social activism and opposition that matters to society as a whole, declaring that great public risk lies in *Myriad*’s patents.²⁰⁵ The case comprises part of a wider array of social activism and resistance to gene patenting.²⁰⁶ The point here is that when we view patent challenges, we traditionally focus on the legal-economic ends, which coincide with the bulletin-board paradigm, while overlooking the other ends, such as activism and social change. These non-traditional ends do not necessarily replace the traditional ones but pile up in addition to them.

These examples—patent text, patent pledging, and patent challenge—are just the tip of the iceberg. Other patent-related actions

²⁰¹ Sandra S. Park, *Gene Patents and the Public Interest: Litigating Association for Molecular Pathology v. Myriad Genetics and Lessons Moving Forward*, 15 N.C. L.J. & TECH. 519 (2014) (describing the *Myriad* case as a public interest case in patent law advocacy).

²⁰² *See id.* (the main issue in the case was the eligibility of patents on the BRCA1/2 genes).

²⁰³ *See generally* Jorge L. Contreras, *Association for Molecular Pathology v. Myriad Genetics: A Critical Reassessment*, 27 MICH. TECH. L. REV. 1 (2021) (offering a textual analysis of the *Myriad* decision); Contreras, *supra* note 199, at 1162–69 (analyzing the Access and Dystopian Narratives in the *Myriad* case).

²⁰⁴ *The Fight to Take Back Our Genes*, *supra* note 200.

²⁰⁵ *See* Timothy Caulfield et al., *Myriad and the Mass Media: The Covering of a Gene Patent Controversy*, 9 GENETICS MED. 850, 850 (2007) (finding that “*Myriad Genetic*’s BRCA1/2 gene patents sparked significant international newspaper coverage in comparison to other stories on gene patenting controversies,” with “majority of articles (77.6%) had a negative overall tenor” and “only 6.29% had a positive overall tenor”).

²⁰⁶ *See supra* note 199.

may realize multiple goals, some of them with communicative value.

Another way patents serve a communicative role can be seen in the distinction between content and meta-data. Under the bulletin-board paradigm, a patent medium's primary component is the content, and more specifically, the disclosure.²⁰⁷ The centrality of and focus on disclosed content makes sense when viewing the informing function as the patent medium's sole function. However, the disclosure—and more broadly, content—is not the only useful constituent in the patent system; when considering the patent medium as having a communicating function as well, its role becomes much richer than disclosure alone. Various content and meta-data within the patent system comprises relevant components of the patent medium, including file wrappers, reexamination or invalidation proceedings, PTO announcements, pledges, licensing, the 'Patent' and 'Patent Pending' symbols,²⁰⁸ and patent statistics. For instance, file wrappers—an extra-disclosure element—hold both content and meta-data regarding the examination of a patent application, chiefly PTO-applicant correspondences.²⁰⁹ The content of file wrappers bears high value for competitors who wish to better understand the applicant's technological achievements and struggles, which may be beneficial for uses like challenging a patent.²¹⁰ Note that in such cases, the sender of the message is not necessarily the applicant; the sender in a file wrapper may be the PTO, highlighting issues regarding the invention for others or anchoring the applicant's position for future proceedings.²¹¹

²⁰⁷ See *supra* notes 131–32 and accompanying text.

²⁰⁸ See *e.g.*, 35 U.S.C. §§ 287, 292.

²⁰⁹ See *supra* note 153.

²¹⁰ Assad Abbas et al., *A Literature Review on the State-of-the-Art in Patent Analysis*, 37 WORLD PAT. INFO. 3 (2014) (“a file wrapper include[s] information, such as first amendment, rejection, interference, and the original application”); Alan C. Marcoa et al., *Patent Claims and Patent Scope*, 48 RES. POL'Y 1, 7 (2019) (“file wrapper (alternatively, image file wrapper or IFW) of a published application comprises the full documentation of each individual application, including the initial filing, office actions by examiners, claim amendments, disclosures, etc.”).

²¹¹ An applicant who makes narrowing amendments to the application during the prosecution process is precluded from broadening the claims' scope later to cover subject matter ceded by the amendments. This doctrine is known as “prosecution history estoppel” or “file wrapper estoppel.” See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*,

For the importance of meta-data in patent communication, consider the example of the obsessive engagement of political and business entities with the number of patents to outline a hierarchy. The patent hierarchy discourse is a part of wider technological and economic conversations, especially when comparing among superpowers (e.g., the national number of patents)²¹² and multinational companies (e.g., the size of a “patent portfolio,” or the collection of all patents a firm holds).²¹³ With such actors, patent statistics—meta-data derived from the patent space—are an important communicative element, serving as both an instrument for and an indicator of such hierarchy.²¹⁴

Importantly, the network paradigm does not reject the informing function. To the contrary, the network paradigm adopts the informing function and supplements the communicating function. Therefore, previous research regarding the informing function, such as disclosure literature, remains highly valuable, and the network paradigm relies on its insights.²¹⁵ In other words, while rejecting neither the informing function nor the importance of disclosure in patent

Ltd., 535 U.S. 722, 723 (2002). There are some exceptions to this doctrine; for instance, when the alleged equivalent was unforeseeable technology at the time of application or when the rationale underlying a narrowing amendment bears only a tangential relation to the equivalent in question. *See id.* at 740–41.

²¹² *See* Cohen, *supra* note 7; Yu Xiaoming, *China Patent Applications Hit Record 1.54 Million in 2018*, CHINADAILY (Oct. 16, 2019, 1:54 PM), <https://www.chinadaily.com.cn/a/201910/16/WS5da6b0a9a310cf3e35570d07.html> [<https://perma.cc/JEQ8-BYQQ>].

²¹³ *See* Louis Columbus, *The Most Innovative Tech Companies Based on Patent Analytics*, FORBES (Dec. 15, 2019, 11:05 AM), <https://www.forbes.com/sites/louiscolumbus/2019/12/15/the-most-innovative-tech-companies-based-on-patent-analytics/> (last visited May 10, 2022); Susan Decker, *Huawei Has 56,492 Patents and It's Not Afraid to Use Them*, BLOOMBERG (June 14, 2019, 1:07 PM), <https://www.bloomberg.com/news/articles/2019-06-14/huawei-has-56-492-patents-and-it-s-not-afraid-to-use-them> (last visited Apr. 11, 2022).

²¹⁴ WIPO, *Facts and Figures* (2022), <https://www.wipo.int/edocs/infogdocs/en/ipfactsandfigures/> [<https://perma.cc/W926-XDPM>]; Zvi Griliches, *Patent Statistics as Economic Indicators: A Survey*, 28 J. OF ECON. LITERATURE 1661 (1990) (explaining why patent statistics, despite the difficulties that arise in their use, are good economic indicators); Sadao Nagaoka et al., *Patent Statistics as an Innovation Indicator*, in HANDBOOK OF THE ECONOMICS OF INNOVATION 1083 (Bronwyn H. Hall & Nathan Rosenberg eds., 2010) (reexamining Griliches' model of patent statistics as economic indicators).

²¹⁵ *See* Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401, 444–45 (2010); Fromer, *supra* note 1; Rantanen, *supra* note 1.

communication, the network paradigm points at the significance of other (overlooked) contents beyond disclosure and at meta-data in patent communication.²¹⁶

2. “The How”: Multi-Directional Flow

The bulletin-board paradigm comprises a linear communication with messages flowing from the applicant to groups from the larger public, but not in the reverse direction.²¹⁷ In contrast, the organizing principle of the network paradigm this Article suggests is multi-directionality. The multi-directional flow recognizes the potential and importance of a feedback loop in the patent space. Such a feedback mechanism is interactive and simultaneous, as it allows parallel actions by different players.

One can see a communication flow in the opposite direction—namely, from the public to the applicant/patentee—in the case of patent reviews. Patent reviews are a genre of online writing that resembles a consumer review.²¹⁸ A tech-journalist updates the public about a patent application or a newly granted patent and reviews the invention at hand; such a review is usually open for public discussion, allowing others to scrutinize, praise, criticize, or mock the invention.²¹⁹ Beside the ideas of creating a buzz or encouraging the establishment of a community, such comments may be useful to applicants, patentees, or other players in the patent space.²²⁰ Namely,

²¹⁶ Such as file wrappers, patent reviews, patents statistics, patent continuations. *See supra* notes 153–56 and accompanying text.

²¹⁷ *See supra* notes 139–42 and accompanying text.

²¹⁸ *See* GizmoChina-Patents, *supra* note 193; Patently Apple, *supra* note 193; Patently Mobile, *supra* note 193.

²¹⁹ *See, e.g.*, Zhang, *supra* note 199.

²²⁰ *See* JANELLE BARLOW & CLAUS MØLLER, A COMPLAINT IS A GIFT: RECOVERING CUSTOMER LOYALTY WHEN THINGS GO WRONG 71 (2d ed. 2008) (describing customer reviews as “a most valuable asset” firm can receive to improve and offering methods to do so); Nikolay Archak et al., *Deriving the Pricing Power of Product Features by Mining Consumer Reviews*, 57 MGMT. SCI. 1485, 1488 (2011) (discussing the high value of consumer reviews and demonstrating how to use them for consumers’ preferences and predictive modeling of sales); Minqing Hu & Bing Liu, *Mining and Summarizing Customer Reviews*, PROCEEDINGS OF THE 10TH INTERNATIONAL CONFERENCE ON KNOWLEDGE DISCOVERY AND DATA MINING 168, 168 (2004) (proposing techniques to process customer reviews).

in such cases a message flows in a different direction than the traditional, uni-directional patentee-to-public flow.²²¹

Another instance of multi-directional flow is the continuation practice under U.S. patent law.²²² A continuing patent application is an application that follows, and claims priority to, a previously-filed application.²²³ The continuation procedure allows for discourse: an applicant files for a patent; the public and market then react to this application in certain ways; after which the applicant uses continuations to account for such reactions; and the public can react again. Such a conversation is evident in plenty of incidents. For example, Rambus, a company engaged in chip interface technologies, repeatedly filed continuations that successively captured developments in the field of synchronous dynamic random-access memory (“SDRAM”).²²⁴ Courts and the International Trade Commission discussed Rambus’s practice.²²⁵ There is a conversation—not one-sided announcements—that transpires through the patent medium.

The examples of patent reviews and continuation practices show more than just the different directions that messages take in the patent medium—they demonstrate the various trajectories a message can travel from a sender to a recipient. An individual (e.g., a potential consumer or a tech-fan) can acquire familiarity with an invention which is under patent examination through an online patent review.²²⁶ Alternatively, a recipient may discover this information by noticing the invention elsewhere (e.g., a shop), carrying a “Patent Pending” indication.²²⁷ In both communication routes, the message travels from an applicant to an individual; however, the route each case takes is different, specifically in terms of the intermediary that

²²¹ See *supra* notes 139–42 and accompanying text.

²²² See 35 U.S.C. § 111(a); 37 C.F.R. § 1.53(b) (2015).

²²³ See 35 U.S.C. § 111(a); 37 C.F.R. § 1.53(b) (2015).

²²⁴ David Alban, *Rambus v. Infineon: Patent Disclosures in Standard-Setting Organizations*, 19 BERKELEY TECH. L.J. 309, 320–22 (2004).

²²⁵ See *Rambus, Inc. v. Infineon Techs. AG*, 330 F. Supp. 2d 679, 682–88 (E.D. Va. 2004) (describing Rambus’ continuation); *Rambus Inc. v. Infineon Techs. AG*, 318 F.3d 1081, 1084–85, 1107 (Fed. Cir. 2003) (describing Rambus’ continuations); *Certain Semiconductor Chips and Products Containing Same*, Inv. No. 337-TA-753, USITC Pub. 4386 (Mar. 2013) (Final) (describing Rambus’ continuations).

²²⁶ See *supra* notes 218–20 and accompanying text.

²²⁷ See *supra* note 208.

mediates the message.²²⁸ Hence, it is unsurprising that each route may deliver a message differently and impact the message itself, leading to differing communications and effects.²²⁹

3. Levels of Access: Public and Private Spheres

Whereas the bulletin-board paradigm focuses only on the patent medium's public sphere—the public information that a patent application discloses—the network paradigm seeks to expand the view to encompass both public and private spheres. Communication processes within the patent medium are not always transparent, yet they comprise an integral part of patent communication. Some instances of such private communications include an applicant's communications with a patent attorney,²³⁰ patentee-licensee communications,²³¹ patentee-rival communications in settling disputes,²³² or applicant/patentee-PTO communications (i.e., communications that do not reside in the prosecution file history).²³³

Private connections may ultimately influence patent communication, including its public sphere. For example, an applicant's communication with her patent attorney may influence the content and style of the patent documents, the timing of various events (e.g., applying for or abandoning a patent), and even the approval or rejection of an application.²³⁴ Other examples include the impact of a

²²⁸ In the patent review example, the reviewer delivers a direct, explicit interpretation of the message, while in the “Patent Pending” instance, the intermediary—a mere symbol—plays its role in a subtle way.

²²⁹ This corresponds with medium theory, a widely-recognized approach in communication studies, maintaining that the trajectory of communication impacts the message itself. See DERRICK DE KERCKHOVE, *THE ALPHABET AND THE BRAIN: THE LATERALIZATION OF WRITING I* (Derrick de Kerckhove & Charles J. Lumsden eds., 1988); HAROLD A. INNIS, *EMPIRE AND COMMUNICATIONS* 7, 28, 216 (2007); HAROLD A. INNIS, *THE BIAS OF COMMUNICATION* (2d ed. 1951); MARSHALL McLUHAN, *UNDERSTANDING MEDIA* 7–23, 65–67 (1964); JOSHUA MEYROWITZ, *NO SENSE OF PLACE: THE IMPACT OF ELECTRONIC MEDIA ON SOCIAL BEHAVIOR* 73–114 (1986); NEIL POSTMAN, *AMUSING OURSELVES TO DEATH: PUBLIC DISCOURSE IN THE AGE OF SHOW BUSINESS* 66–76 (1985).

²³⁰ See Spalding, *supra* note 147.

²³¹ See Lemley & Myhrvold, *supra* note 147.

²³² See Patterson, *supra* note 147.

²³³ Manual of Patent Examining Procedure § 724.02.

²³⁴ Christina Koller & Bernd Ebersberger, *How Do Characteristics of Patent Attorneys Influence Patent Quality?*, 15 DRUID 1, 4–5, 10–12 (2015), https://conference.druid.dk/acc_papers/0if3bt5fal3k8xlordvg0f2bn23h.pdf [<https://perma.cc/2L6W-KNUJ>]; Sevim

confidential patent license and dispute resolution on the market;²³⁵ such licenses and settlements are usually confidential (namely, a private sphere), and cause other players in the patent space to play in a “blind” market (i.e., a public sphere).²³⁶ Once we grasp that patent communication is comprised of more than just public channels, we better comprehend the actual complexity of patent communication. For instance, characterizing the major elements in the (private) applicant-patent agent communication may unveil various considerations in formulating a patent application besides obtaining broad patent rights, like a firm’s intention to lie low and avoid opposition or an agent’s desire to maintain a high success rate. Analyzing this private channel allows for better understanding of the public channel—the published patent documents (e.g., patent disclosure, claims, and file wrappers)—as well as the environment in which applicant-patent agent communications occur. The applicant-patent agent communication is just an example, and the point is that fully understanding the patent medium requires consideration of both the public and private spheres.

Importantly, this Article does not argue that all patent communications must be public. There are various justifications for confidentiality on many occasions in patent communications such as patent agent-client privilege.²³⁷ However, assimilating the possible effects of private channels on public channels (and vice versa), and subsequently the influence on patent communication in general, facilitates our comprehension of the patent medium.

4. “The Who”: Multiple Participants

The bulletin-board paradigm views the patent medium as a ternary complex: the applicant/patentee, the public, and the PTO. Indeed, these are the most basic participants. However, a closer look at the patent space reveals that additional agents take part in the

Süzeroğlu-Melchioris et al., *Friend or Foe? The Effects of Patent Attorney Use on Filing Strategy vis-a-vis the Effects of Firm Experience*, 55 MGMT. DECISION 1122 (2017) (examining strategic considerations taken by patent attorneys concerning patent filing decisions).

²³⁵ See Lemley & Myhrvold, *supra* note 147; Patterson, *supra* note 147.

²³⁶ See Lemley & Myhrvold, *supra* note 147; Patterson, *supra* note 147, at 827.

²³⁷ See Spalding, *supra* note 147.

discourse and influence messages, including licensees, legal parties (e.g., patent challengers or parties requesting to reexamine a patent), courts, patent attorneys, journalists, consumers, tech-fans, organizations (e.g., WIPO, WTO, OECD), political entities, and other jurisdictions. The internet resulted in two major changes that further expanded the circle of participants: broader availability and cost-reduction.²³⁸ The meaning of geographic distance, information volume, and communication speed has changed.²³⁹ Moreover, the internet reduced information-related costs, such as searching, replicating, and distributing.²⁴⁰ These changes allow for more voices, placing various communicative deeds within the reach of myriad individuals.

In this context, intermediaries deserve particular attention. Intermediaries are participants who transport, reproduce, and otherwise process messages.²⁴¹ Theories of mass communication focus on the significant role that intermediaries often play in the communication process.²⁴² Whereas traditional intermediary theory specifically addresses how individuals receive news, Karine Nahon has suggested applying the theory to all information.²⁴³ Intermediary activity

²³⁸ See YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* 54–56 (2006) (describing the changes brought by the digitally networked environment); DAVID CROTEAU & WILLIAM HOYNES, *MEDIA/SOCIETY: INDUSTRIES, IMAGES, AND AUDIENCES* 94–101 (6th ed. 2019) (characterizing the internet as an “open, decentralized platform, accessible to anyone,” with a structure “designed to give users considerable control over their experience.” Moreover, the internet is a global system, “whose governance structure transcends the regulatory reach of any single country.”).

²³⁹ See BENKLER, *supra* note 238; CROTEAU & HOYNES, *supra* note 238.

²⁴⁰ See BENKLER, *supra* note 238; CROTEAU & HOYNES, *supra* note 238; Paul DiMaggio et al., *Social Implications of the Internet*, 27 ANN. REV. SOCIO. 307, 313, 323 (2001) (“By dramatically reducing the cost of the replication and distribution of information, the Internet has the potential to create arenas for more voices than any other previous communication medium.”).

²⁴¹ JAMES WATSON & ANNE HILL, *DICTIONARY OF MEDIA AND COMMUNICATION STUDIES* 178 (8th ed. 2012).

²⁴² See Elihu Katz, *The Two-Step Flow of Communication: An Up-to-Date Report on a Hypothesis*, 21 POL. OP. Q. 61 (1957) (suggesting that the flow of information and influence from the mass media to their audiences involves two steps: from the media to certain individuals and from them to the public).

²⁴³ See Karine Barzilai-Nahon, *Gatekeeping: A Critical Review*, 43 ANN. REV. INFO. SCI. & TECH. 1 (2009); Karine Barzilai-Nahon, *Toward a Theory of Network Gatekeeping: A*

relates to both the structural and content-based architecture of information with which actors come into contact.²⁴⁴ Intermediaries can decide what messages others see, in what context, and under which conditions.²⁴⁵ The intermediation functions include selecting, adding, withholding, displaying, channeling, shaping, manipulating, repeating, timing, localizing, integrating, disregarding, and deleting information.²⁴⁶ Different combinations of such functions lead to various archetypes of intermediaries: gatekeepers, directors, regulators, performers, recorders, editors, integrators, representatives, reproducers, and carriers.²⁴⁷

Applying the *two-step flow model*—a longstanding theory of communication studies and sociology²⁴⁸—to the patent medium underscores the importance and power of intermediaries in patent communication. The two-step flow model posits that most people form their opinions under the influence of *opinion leaders*.²⁴⁹ Opinion leaders are super-active users who interpret messages for other, lower-end users.²⁵⁰ Typically, opinion leaders have expertise; hence, they are held in high esteem by lower-end users.²⁵¹ Opinion leaders facilitate the diffusion of communications.²⁵² Given their more literate understanding of certain topics, opinion leaders explain and spread messages to others, though not necessarily in accordance

Framework for Exploring Information Control, 59 J. AM. SOC'Y FOR INFO. SCI. & TECH. 1493, 1493 (2008).

²⁴⁴ See Marcelo Thompson, *Beyond Gatekeeping: The Normative Responsibility of Internet Intermediaries*, 18 VAND. J. ENT. & TECH. L. 783, 787 (2016).

²⁴⁵ See Barzilai-Nahon, *Toward a Theory of Network Gatekeeping: A Framework for Exploring Information Control*, *supra* note 243, at 1496–97.

²⁴⁶ *See id.*

²⁴⁷ *See* Foulger, *supra* note 96.

²⁴⁸ *See* KATZ & LAZARFELD, *supra* note 17; LAUGHEY, *supra* note 17, at 23–25; Katz, *supra* note 242.

²⁴⁹ *See* ROBERT K. MERTON, *SOCIAL THEORY AND SOCIAL STRUCTURE* 467–69 (1957); Leisa Reinecke Flynn et al., *Opinion Leaders and Opinion Seekers: Two New Measurement Scales*, 24 J. ACAD. MKTG. SCI. 137, 137 (1996).

²⁵⁰ *See* WATSON & HILL, *supra* note 241, at 214.

²⁵¹ *See id.*

²⁵² Ronald S. Burt, *The Social Capital of Opinion Leaders*, 566 ANNALS OF AM. ACAD. OF POL. & SOC. SCI. 37 (1999) (elaborating on the role of opinion leaders in diffusing innovation-related information).

with a sender's intention.²⁵³ Examples of opinion leaders are teachers, attorneys, and media professionals.²⁵⁴

The notion of opinion leadership suggests that a major part of communication depends neither on the sender nor on actual content, but rather on intermediaries.²⁵⁵ The role of opinion leaders in the patent medium is particularly essential because patent communication most often requires a certain degree of expertise, be it of a legal or technological orientation.²⁵⁶

Incorporating the two-step flow into the patent medium paradigm enables us to comprehend ideas and arguments in patent literature that are currently hypothetical and vague. Long, Asay, and Anderson have argued that patentees use patent disclosures and pledges to signal to consumers and investors.²⁵⁷ However, a large proportion of recipients—be they consumers, inventors, or other groups—do not actually read patent disclosures, pledges, or other patent documents.²⁵⁸ Someone mediates the message for them; intermediaries, such as patent experts and attorneys,²⁵⁹ journalists and bloggers,²⁶⁰ scientists,²⁶¹ and activists,²⁶² act as opinion leaders. None of the

²⁵³ Annika Bergström & Maria Jervelycke Belfrage, *News in Social Media*, 6 DIGIT. JOURNALISM 583, 593 (2018); Xiaofei Zhang & Dahai Dong, *Ways of Identifying the Opinion Leaders in Virtual Communities*, 3 INT'L J. OF BUS. & MGMT. 21, 21–22 (2008); Robert V. Kozinets et al., *Lost in Translation: The Social Shaping of Marketing Messaging*, 6 MKTG. INTEL. REV. 22 (2014) (maintaining that during dissemination of a message, its meaning and value are changing).

²⁵⁴ See Matthew Nisbet, *Ambassadors for Science: Harnessing the Power of Opinion-Leaders Across Communities*, 42 SKEPTICAL INQUIRER 30, 31 (2018).

²⁵⁵ See Katz, *supra* note 242, at 75–78.

²⁵⁶ Dan L. Burk & Jessica Reyman, *Patents as Genre: A Prospectus*, 26 L. & LITERATURE 163, 183 (2014) (arguing that only patent experts possess the necessary skills to navigate and comprehend patent documents, and specifically patent claims).

²⁵⁷ See *supra* notes 49–76, and accompanying text.

²⁵⁸ See Burk & Reyman, *supra* note 256, at 185 (“[patent-related] practices are mediated by an expert community that authors, defines, enforces, and executes the social meaning of the patent.”).

²⁵⁹ Mainly serving as intermediaries between applicants or patentees and PTOs, Courts, or legal parties. See Burk & Reyman, *supra* note 258, at 178–80.

²⁶⁰ See sources cited *supra* notes 5–9, 193.

²⁶¹ For instance, see generally Sadhana Chitale et al., *Understanding the Basics of Patenting*, 38 NATURE BIOTECH. 263 (2020). Also, scientific literature (such as Nature Biotechnology) has a regular column that mediates patents to scientists. See e.g., *Xenotransplantation*, 18 NATURE BIOTECH. 418, 418 (2000).

²⁶² See *supra* notes 198–200.

aforementioned studies have elaborated on intermediation, despite their indispensability within patent communications.²⁶³ Without intermediation, one cannot understand how patent communication (including patent signals) transpires. The intermediation's considerable significance in communication processes requires us to consider intermediaries when examining patent communications. Indeed, limiting our view to the oversimplified triangle of patentee-PTO-public and ignoring various go-betweens may be misleading.

A caveat is due: the bulletin-board paradigm is not incompatible with the existence of multiple players, but its focus is on the basic ternary complex. This approach disregards communication and players that are peripheral to the patentee-PTO-public linkage. The bulletin-board paradigm does not object to the existence of a printing house, editor, publisher, or other players located between the sender and the recipient. Nevertheless, this paradigm tends to overlook the intermediation function due to the very nature of a bulletin board's focus on content. By contrast, the network paradigm aims at the bigger picture, incorporating players that are not at the forefront but still influence the message. Moreover, even when the bulletin-board paradigm acknowledges a peripheral player, it is not in the context of communication, but rather views such a player as a technician. For instance, the bulletin-board paradigm might consider patent attorneys, but only the context of meeting legal standards or prevailing in lawsuits. Thus, it explores these players' legal functions but not their communicative ones.

5. A Repeated Game: Continuous Communication

The patent system is not a single-shot game but more often a repeated one. Namely, it is a game of many iterations, in which players engage in continuous communication, with each interchange affected by previous actions and affecting future actions.²⁶⁴

²⁶³ See *supra* note 80.

²⁶⁴ GEORGE J. MAILATH & LARRY SAMUELSON, REPEATED GAMES AND REPUTATIONS: LONG-RUN RELATIONSHIPS 1–10 (2007).

Under the bulletin-board paradigm, once a patent is published (or rejected by the PTO before publication), the game is over.²⁶⁵ A new patent application means a new game with new information. Although some have discussed patent portfolios,²⁶⁶ they approached them with a commercial orientation and did not focus on communicative aspects. Namely, from a communication perspective, each patent stands on its own.²⁶⁷ However, the network paradigm grasps communication as a continuous, ongoing process with an indeterminate number of stages. Even when a message concerns a particular patent, it is merely a segment of a more extensive communication process.

The continuation practice described above²⁶⁸ provides a good example to demonstrate the notion of ongoing communication. The continuation practice enables parties to play an ongoing game by reacting to other players or changes. Moderna's mRNA patents demonstrate such dynamics: Moderna filed the key patents for its mRNA vaccine years ago, which make no mention of COVID-19 since it did not exist.²⁶⁹ Yet today, Moderna is filing continuations that specifically cover COVID-19-related developments.²⁷⁰ Moderna is able to better react to changes (in addition to securing its commercial interests) through the continuation practice.²⁷¹

²⁶⁵ As communication is linear and sender-centric, namely, no feedback by other players (except for the official PTO as a gatekeeper) is taken into account. *See supra* notes 139–43.

²⁶⁶ *See* Michele Grimaldi et al., *The Patent Portfolio Value Analysis: A New Framework to Leverage Patent Information for Strategic Technology Planning*, 94 *TECH. FORECASTING SOC. CHANGE* 286, 286 (2015); Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 *U. PA. L. REV.* 1 (2005).

²⁶⁷ *See supra* note 265.

²⁶⁸ *See* 35 U.S.C. § 111(a); 37 C.F.R. § 1.53(b) (2015).

²⁶⁹ *See* U.S. Patent No. 10,272,150 (filed July 20, 2018).

²⁷⁰ *See* U.S. Patent No. 10,702,600 (filed Feb. 28, 2020).

²⁷¹ *See generally* Bruce A. Kaser, *Patent Application Recycling: How Continuations Impact Patent Quality & What the USPTO Is Doing About It*, 88 *J. PAT. & TRADEMARK OFF. SOC'Y* 426 (2006) (explaining how continuations allow patentees to 'recycle' unsuccessful applications instead of being rejected); Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 *EMORY L.J.* 181 (2008) (maintaining that continuations is a powerful tool for applicants, enabling them to overcome anticipated rejections); Cecil D. Quillen & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office*, 11 *FED. CIR. B.J.* 1, 13 (2001)

Namely, continuations are one component in the patent space that enable a repeated game by allowing for auxiliary communication that transpires within a specific context of previous moves in the repeated patent game.

Viewing the patent medium as a repeated game makes sense in light of empirical data. Most patentees are frequent applicants who engage repeatedly in the patent system.²⁷² Clearly, other players in the patent space—patent agents and attorneys, PTOs, courts, scientists, competitors, journalists, investors, and consumers—also repeatedly participate in the patent game.²⁷³

Game theorists have extensively studied communication in repeated games.²⁷⁴ Based on their approach, applying the network paradigm—espousing the notion of patent communication as a repeated game—to the patent system enables a better understanding of the relations and actions within the patent space. A repeated game renders the patent system an arena with features such as cooperation,²⁷⁵ reward-and-punishment,²⁷⁶ and reputation.²⁷⁷ For instance, in

(arguing that, thanks to the continuation practice, applicants can increase the grant rate to roughly ninety-seven percent).

²⁷² See *Patent Assignment Dataset*, USPTO (June 25, 2021, 12:23 PM), <https://www.uspto.gov/learning-and-resources/electronic-data-products/patent-assignment-dataset> [<https://perma.cc/BB6D-7FUY>]; Francesca Arnaboldi & Peter Claeys, *Banks and Patents in the U.S.*, in *INNOVATION IN FINANCIAL SERVICES: A DUAL AMBIGUITY* 70, 80–81 (Anne-Laure Mention & Marko Torkkeli eds., 2014); Hazel V. J. Moir, *Who Benefits? An Empirical Analysis of Australian and US Patent Ownership* 10–11 (Ctr. for Governance of Knowledge and Dev., Working Paper, 2008).

²⁷³ Patent agents, PTOs, and courts are frequent players in the legal arena; scientists and competitors are frequent players in the technological arena; journalists, investors and consumers are frequent players in the economic-financial arena.

²⁷⁴ See Antonio A. Arechar et. al, “I’m Just a Soul Whose Intentions Are Good”: *The Role of Communication in Noisy Repeated Games*, 104 *GAMES & ECON. BEHAV.* 726, 726 (2017); Elchanan Ben-Porath & Michael Kahneman, *Communication in Repeated Games with Costly Monitoring*, 44 *GAMES & ECON. BEHAV.* 227, 227 (2003).

²⁷⁵ See Yu Awaya & Vijay Krishna, *Communication and Cooperation in Repeated Games*, 14 *THEORETICAL ECON.* 513, 513 (2019); Pedro Dal Bó & Guillaume R. Fréchet, *The Evolution of Cooperation in Infinitely Repeated Games: Experimental Evidence*, 101 *AM. ECON. REV.* 411, 411 (2011).

²⁷⁶ See Matthias Sutter et al., *Choosing the Carrot or the Stick? Endogenous Institutional Choice in Social Dilemma Situations*, 77 *REV. ECON. STUD.* 1540, 1540 (2010); Julian Wright, *Punishment Strategies in Repeated Games: Evidence from Experimental Markets*, 82 *GAMES & ECON. BEHAV.* 91, 92 (2013).

²⁷⁷ See MAILATH & SAMUELSON, *supra* note 264, at 459.

iterated games of unknown rounds (such as the patent medium), the preferred strategy is not a Nash strategy but a socially optimal strategy.²⁷⁸

With reputation systems and reward-and-punishment methods, the network paradigm expounds patent communication as a viable strategy rather than merely an obligation imposed by the patent bargain. Moreover, unlike the classical view of a single-shot patent game in which deceiving and concealing are favorable strategies, the network paradigm—through the repeated game notion—reveals the coexisting incentives for cooperation, trust, and honesty among participants, more often than one might assume.²⁷⁹

For example, incorporating reputation systems and reward-and-punishment methods into patent communication enables us to better rationalize licensing, cross-licensing, and patent pledges.²⁸⁰ Licensing and pledging of valuable patents may sometime look irrational under a single-shot game view, as parties (seem to) act against their interests.²⁸¹ However, licensing or pledging a precious asset (like patents related to COVID-19)²⁸² makes perfect sense when considering the repeated game notion.²⁸³ One might strategically license or cross-license patent rights to others—namely, play cooperatively—as there are reasonable chances the former would need the latter in the future.²⁸⁴ In addition, at times, patentees must manifest solidarity

²⁷⁸ See Robert J. Aumann, *Acceptable Points in General Cooperative n-Person Games*, in *CONTRIBUTIONS TO THE THEORY OF GAMES* 287, 323 (1959).

²⁷⁹ For elaboration on game theory in the context of patent law (and intellectual property, in general), see Ted Sichelman, *Quantum Game Theory and Coordination in Intellectual Property*, *SAN DIEGO LEGAL STUD.* (forthcoming 2015) (manuscript at 1).

²⁸⁰ For more information on cross-licensing, see Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in *INNOVATION POLICY & THE ECONOMY* 119, 129 (Adam B. Jaffe et al. eds., 2001). For more information on patent pledges, see *supra* note 27.

²⁸¹ As in the case of licensing or pledging a highly valuable patented invention to others instead of fully exploiting its commercial value.

²⁸² See *supra* note 159.

²⁸³ See Oliver Baldus, *Patent-Based Cooperation Effects*, 5 *J. INTELL. PROP. L. & PRAC.* 111, 114 (2010); Mukesh Eswaran, *Cross-Licensing of Competing Patents as a Facilitating Device*, 27 *CAN. J. ECON.* 689, 690 (1994).

²⁸⁴ See Aumann, *supra* note 278; MAILATH & SAMUELSON, *supra* note 264, at 2–6; Dal Bó et al., *The Evolution of Cooperation in Infinitely Repeated Games: Experimental Evidence*, 101 *AM. ECON. REV.* 411 (2011) (demonstrating that under certain circumstances, a cooperative behavior in repeated games leads to an equilibrium).

with the public, including voluntarily pledging a promising patent, as part of long-term planning regarding public image, branding, and consumerism.²⁸⁵ The repeated game concept suggests that such acts hold a communicative value, reflecting features such as cooperation, solidarity, or decency; and as a part of a continuous communication, they could be of high value for later stages of the game.

* * *

This Section presented gaps between the bulletin-board paradigm and the network paradigm, and hence, may erroneously provide the impression that these are two opposite spheres. Indeed, at times, the bulletin-board paradigm and the network paradigm can lead to different results. However, in most circumstances, the network paradigm does not contradict the bulletin board's view but rather sharpens and illuminates features of the patent medium that have been overlooked.²⁸⁶

Further, the two paradigms share four communicative features underlying the very core of the patent system. This Article defines them as the *trivial communicative traits*: (1) identification; (2) credibility; (3) context; and (4) interactivity.

"Identification" refers to the fact that a patent specifies the identity of players, including the applicant, the inventor,²⁸⁷ the patent owner, the patent attorney, and the PTO.²⁸⁸ Such official identification reveals the communicator's identity.²⁸⁹ From a communication perspective, this is valuable information, especially in our global village.²⁹⁰ Notwithstanding that the patent medium falls short of

²⁸⁵ See Aumann, *supra* note 278; MAILATH & SAMUELSON, *supra* note 264, at 2–6; Dal Bó et al., *supra* note 284.

²⁸⁶ See *supra* Part IV.B.

²⁸⁷ See *supra* note 79.

²⁸⁸ These details are codified in a universal indication system called "Committee on WIPO Standards." *Standard St.9*, in HANDBOOK ON INDUSTRIAL PROPERTY INFORMATION AND DOCUMENTATION 3.9.1 (June 2013), <https://www.wipo.int/export/sites/www/standards/en/pdf/03-09-01.pdf> [<https://perma.cc/4859-EMAB>].

²⁸⁹ See *id.*

²⁹⁰ Note that the assignee is not necessarily the current owner, as assignment need not be recorded in the PTO. See BRENDA J. ALLEN, DIFFERENCE MATTERS: COMMUNICATING SOCIAL IDENTITY xi (2d ed. 2004); Michael L. Hecht, 2002—*A Research Odyssey: Toward the Development of a Communication Theory of Identity*, 60 COMM'C'N MONOGRAPHS 76, 77–82 (1993).

disclosing all participants' identities (e.g., licensees), even a partial, official list has considerable value.

Credibility is the believability and integrity of a message.²⁹¹ Credibility affects the extent to which others are willing to accept a message and treat it seriously.²⁹² Various features in patent law confer credibility:²⁹³ professional, external examination of applications;²⁹⁴ duties of candor and good faith;²⁹⁵ the doctrine of estoppel;²⁹⁶ the rule against recapture;²⁹⁷ patent misuse throughout post-patent licensing;²⁹⁸ the marking statute;²⁹⁹ and the fact that a patent can be exposed to invalidation after being granted.³⁰⁰ Filtering mechanisms in the patent system, monetary (e.g., fees) and bureaucratic (e.g., patent renewal) alike, further enhance credibility.

Context encapsulates the idea that the patent system was designed to communicate invention-oriented messages, and so the patent medium inherently operates in a professional-technical context. Legal concepts such as prior art,³⁰¹ enablement,³⁰² drawings,³⁰³ the

²⁹¹ See Ortwin Renn & Debra Levine, *Credibility and Trust in Risk Communication, in COMMUNICATING RISKS TO THE PUBLIC* 175, 175 (Roger E. Kasperson & Pieter Jan M. Stallen eds., 1990).

²⁹² See *id.*; Charles A. O'Reilly & Karlene H. Roberts, *Relationships Among Components of Credibility and Communication Behaviors in Work Units*, 61 J. OF APPLIED PSYCH. 99, 99 (1976).

²⁹³ See Holbrook, *supra* note 12, at 576–79, 597–600 (contemplating how patents can act as a modes of communication regarding non-technical information based on the imprimatur of the government, specifically in cases of morally questionable inventions); Long, *supra* note 12, at 637.

²⁹⁴ See Georgine M. Pion & Mark W. Lipsey, *Public Attitudes Toward Science and Technology: What Have the Surveys Told Us?*, 45 PUB. OP. Q. 303, 303 (1981).

²⁹⁵ See 37 C.F.R. §§ 1.56, 11.303(a)–(e), 11.804(c), 42.11 (2012).

²⁹⁶ The doctrine prevents patentees from communicating a message in a certain way vis-à-vis the PTO and subsequently communicating it differently once the patent is granted. See *Shepard v. Carrigan*, 116 U.S. 593, 597–98 (1886); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 723 (2002).

²⁹⁷ See *In re Clement*, 131 F.3d 1464, 1468 (Fed. Cir. 1997); *In re Mostafazadeh*, 643 F.3d 1353, 1358 (Fed. Cir. 2011).

²⁹⁸ See *Brulotte v. Thys Co.*, 379 U.S. 29, 33 (1964); *Kimble v. Marvel Ent., LLC*, 576 U.S. 446, 449 (2015).

²⁹⁹ 35 U.S.C. § 287(a).

³⁰⁰ 35 U.S.C. §§ 282(b)(2)–(3), 302, 311–19.

³⁰¹ See *supra* note 134.

³⁰² 35 U.S.C. § 112(a).

³⁰³ 37 C.F.R. §§ 1.165, 1.84 (2004).

standard of a person having ordinary skill in the art (“PHOSITA”),³⁰⁴ the competence requirement for practicing before the PTO,³⁰⁵ and the Internationally agreed Numbers for the Identification of Data (“INID”) system³⁰⁶ are prominent representations of the professional-technical context of the patent system, imparting an ambiance of an intricate system designed for experts.

The patent system is inherently interactive,³⁰⁷ as every patent interacts with previous innovations (i.e., prior art), with the patent granted only if the invention proves novel and nontrivial (i.e., novelty and non-obviousness).³⁰⁸ Interactivity is specifically manifested in the cross-reference and background sections of patent documents.³⁰⁹

To summarize the points made thus far, Table 1 summarizes the features of the bulletin-board and the network paradigms, as well the trivial communicative traits.

| The Bulletin-Board Paradigm | The Network Paradigm |
|--|---------------------------|
| Informing | Communicating |
| Linearity | A Multi-Directional Flow |
| A Sender-Centric Platform | Complex Relationships |
| A Public Channel | Public & Private Channels |
| A Limited Number of Players | Multiple Participants |
| A Single Shot Game | A Repeated Game |
| Interactivity | |
| Relatively High Credibility | |
| Official Identification (at least partially) | |
| Professional-Technical Framing | |

} Patent System's Trivial Communicative Traits

Table 1: Features of the bulletin-board and network paradigms

Table 1 underscores that the bulletin-board paradigm resembles the linear model, whereas the network paradigm is closer to the

³⁰⁴ See *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 399 (2007); Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885, 886 (2004).

³⁰⁵ 37 C.F.R. § 11.101 (2013).

³⁰⁶ See *supra* note 288.

³⁰⁷ See Sheizaf Rafaeli, *Interactivity: from New Media to Communication*, in *ADVANCING COMMUNICATION SCIENCE: MERGING MASS AND INTERPERSONAL PROCESSES* 110, 110–31 (Robert P. Hawkins et al. eds., 1988).

³⁰⁸ 35 U.S.C. §§ 102(a), 103.

³⁰⁹ 37 C.F.R. § 1.77(b) (2021).

transactional model.³¹⁰ As described above, over time, communication theorists moved from a linear to a transactional mindset, as they found the latter better reflecting a real-world scheme of communication.³¹¹ Likewise, this Article proposes that the legislature adopt the new, more comprehensive network paradigm, which coincides with similar, more general insights in communication studies.

Besides theoretical support from communication studies, there are also practical reasons as to why the network paradigm is superior. The following Part argues that the network paradigm offers more than just a better description of the patent system; it holds potent explanatory power, much fuller and stronger than the bulletin-board paradigm's power, and hence facilitates our understanding of the patent system.³¹² Therefore, this Article's proposal is anchored not only in theoretical reasons or parallel moves in a different discipline; this new paradigm also provides practical tools to advance new understandings in patent law.

B. The Network Paradigm as an Explanatory Tool

This Section demonstrates the potential of the network paradigm as an explanatory tool using real-world situations. It summons again the three sample phenomena presented in Part III and applies the network paradigm to them, illustrating its fine explanatory power in each of the different patent timeline phases.³¹³ This Section shows that the network paradigm succeeds where the bulletin board fails.

1. Rethinking Patent Pledging

The bulletin-board paradigm encounters three major difficulties when explaining pledging (i.e., waiving patent rights fully or partially). First, whereas the bulletin-board paradigm focuses on the formal patent communication—particularly patent disclosure—pledging is an unofficial channel.³¹⁴ Second, while the bulletin-

³¹⁰ See *supra* Part II.

³¹¹ See *supra* Part II.

³¹² Using set theory terminology: the network and the bulletin-board paradigms are not disjointed sets but, rather, intersect at some elements.

³¹³ See *supra* Part III.B.

³¹⁴ As pledging is not an official procedure in patent law. See *supra* notes 157–58 and accompanying text.

board paradigm assumes that patent communications transpire only under the obligation of the patent bargain, pledging is a non-mandatory act of patent communication.³¹⁵ Finally, the bulletin-board paradigm perceives patent communication as having a unilateral purpose of benefiting the public; yet the unavoidable conclusion that pledging must also benefit patentees contradicts this approach and suggests that pledges serve multilateral purposes. The network paradigm, on the other hand, offers a fuller explanation of patent pledging and addresses these three issues using two elements of the network paradigm: the communicating function and the repeated game approach.³¹⁶

Applying the communicating function to patent pledging resolves the issue of pledges as an unofficial, non-PTO-mediated channel. According to the communicating function, the network paradigm does not limit its view to patent disclosure, and more generally to official channels.³¹⁷ Instead of formal information broadcasting, the network paradigm depicts patent communication as a discourse.³¹⁸ Thus, patentees communicate with other players in non-traditional manners—not exclusively through official patent documents, but also through various patent-related instruments, including pledges.³¹⁹

The discourse notion is also helpful in facilitating the second problem—pledging as non-mandatory communication—and perhaps a more general question: what is the explanation for the very existence of voluntary actions in the patent space? A discourse, as opposed to formal-technical exchange, is not subject to mandatory communication. Players can and do voluntarily participate in a discourse and not only when they are obliged to, but because they have an interest in doing so.³²⁰ Put differently, the network paradigm posits that on top of the mandatory legal-technical communication, there are voluntary communications transpiring through the patent medium.

³¹⁵ Pledges are voluntary. *See supra* notes 157–58 and accompanying text.

³¹⁶ *See supra* Parts IV.B.1, 5.

³¹⁷ *See supra* Part IV.A.1.

³¹⁸ *See supra* Part IV.A.2.

³¹⁹ Other examples are patent reviews and patent statistics. *See supra* Part IV.A.1.

³²⁰ *See generally* Barnlund, *supra* note 20.

The pledging discourse is an example of such voluntary communication. Patentees usually declare ideological grounds for their pledges, such as pledging “in the spirit of the open-source movement” designed to enhance competition and innovation³²¹ or to help humanity.³²² But are there other, more down-to-earth interests in participating in the pledging discourse? The repeated game feature, another central element of the network paradigm, suggests a positive answer: in a continuous interaction like patent communication, waiving rights (or other ostensibly altruistic deeds) makes much sense as a strategic move. For instance, patent pledging leads, naturally, to a positive public image for the pledger. Therefore, it may be worthwhile to pledge a patent at one stage of the game to evade sharp public criticism or to commercialize (the same or other) inventions more effectively at future stages. Such considerations are particularly relevant at times when solidarity is needed and the public is hypercritical, such as during crises—indeed, this analysis perfectly coincides with the COVID-19 pledges.³²³ Namely, pledges do more than merely inform about legal changes (e.g., non-enforcement of patent rights); a pledge is a more complex, multipurpose discourse. Tesla’s patent pledge³²⁴ is one instance that demonstrates the discourse-like nature of the patent space. Tesla’s pledge drew much public praise for its (allegedly) altruistic and brave move.³²⁵ Such a pledge is an additional step in enhancing the hype around Tesla and its founder Elon Musk’s business and supporting their unique public image.³²⁶

³²¹ See *Open Patent Non-Assertion Pledge*, *supra* note 158; Musk, *supra* note 158; *Toyota Opens Its Fuel Cell Vehicle Patents for Free Use*, TOYOTA (Jan. 6, 2015), <https://global.toyota/en/detail/4663648> [<https://perma.cc/8ABR-9TC9>].

³²² See *Statement by Moderna on Intellectual Property Matters During the COVID-19 Pandemic*, *supra* note 159; *About Us*, OPEN COVID PLEDGE, <https://opencovidpledge.org/about/> [<https://perma.cc/W2WF-37CR>].

³²³ See *supra* note 159.

³²⁴ See Musk, *supra* note 158.

³²⁵ See Matthew Rimmer, *Elon Musk’s Open Innovation: Tesla, Intellectual Property, and Climate Change*, in *INTELLECTUAL PROPERTY AND CLEAN ENERGY* 515, 515 (Matthew Rimmer ed., 2018) (reviewing Tesla’s pledge as a revolutionizing move toward open innovation). Musk made sure to remind everyone of Tesla’s pledge again. See @ElonMusk, TWITTER (Jan. 31, 2019, 4:07 PM), <https://twitter.com/elonmusk/status/1091080660100440065> [<https://perma.cc/5QKY-WRC8>].

³²⁶ Chris Wilks et al., *Brand Analysis: Elon Musk*, BRAND EXTRACT, <https://www.brandextract.com/Insights/Podcast-Episodes/Brand-Analysis-Elon-Musk/>

From a broad perspective, introducing the repeated game notion highlights that patent communication holds more than the unilateral purpose of informing the public about legal or technical issues. Patent communication has multilateral purposes that encourage discourse, potentially benefiting all participants.³²⁷ For instance, pledging can promote public relations (i.e., benefits the pledgor), serve as advertisements (i.e., benefits the pledgor and consumers), call for collaborations (i.e., benefits the pledgor and potential partners), encourage innovation (i.e., benefits competitors and the public), and so forth.³²⁸

Patent pledging discourse can also be driven by other players rather than the pledger itself. For example, commentators,³²⁹ politicians,³³⁰ and competitors³³¹ might initiate or enhance the pledging discourse. The fact that various players, not only pledgers, can initiate and react to a pledging discourse is also explained by the network paradigm, mainly through two elements: multi-directionality (i.e., that patent communication can flow in different directions) and multiple active participants (i.e., the applicant/patentee is not the only active participant within the patent medium).³³² Moreover, patent pledges clearly reveal the importance of intermediaries—a critical point in the network paradigm—as pledges are not part of the formal patent documents, and thus get published through the intervention of expert intermediaries such as commentators and journalists, and not the conventional PTO intermediary.³³³

[<https://perma.cc/HVA5-W4XP>]; David Adkin, *The Evolution of Elon Musk: The Good, The Bad, and the Ugly*, ADALO, <https://www.adalo.com/posts/the-evolution-of-elon-musk-the-good-the-bad-and-the-ugly> [<https://perma.cc/A9TD-7CGN>].

³²⁷ See *supra* note 278 and accompanying text.

³²⁸ See Vertinsky, *supra* note 165, at 1381–82.

³²⁹ See *About Us*, *supra* note 322.

³³⁰ See Amy Maxmen, *In Shock Move, US Backs Waiving Patents on COVID Vaccines*, NATURE (2021); *Members Discuss TRIPS Waiver, LDC Transition Period and Green Tech Role for Small Business*, WTO (Mar. 11, 2021), https://www.wto.org/english/news_e/news21_e/trip_11mar21_e.htm [<https://perma.cc/A9TD-7CGN>]; *Covid: US Backs Waiver on Vaccine Patents to Boost Supply*, BBC (May 6, 2021), <https://www.bbc.com/news/world-us-canada-57004302> [<https://perma.cc/AN83-QJE8>].

³³¹ See Rimmer, *supra* note 325, at 533–37 (examining how Tesla’s rivals have reacted to Tesla’s pledge); *Toyota Opens Its Fuel Cell Vehicle Patents for Free Use*, *supra* note 321.

³³² See *supra* Part IV.A.2, 4.

³³³ See *supra* notes 158–59.

2. Rethinking Early Publication

Applying the bulletin-board paradigm to the case of early publication leaves two unresolved issues. The common assumption would predict that applicants would postpone publication as much as possible. However, applicants instead request to publish before their deadlines.³³⁴ Also, the bulletin-board paradigm maintains that patent communication takes place to inform about technological and legal matters.³³⁵ However, early publication, by definition, publicizes material that has not yet been approved by the PTO, and thus may contain irrelevant or wrong information.³³⁶ So, how do we explain the common practice of early publication? To address these issues, this Part harnesses the power of the network paradigm, specifically three of its elements: the communicating function, multidirectionality, and multiple participants.³³⁷

A fundamental difference exists between the two paradigms: the bulletin board conceptualizes publication (and generally, patent communication) as a means—that is, publishing *solely* for the purpose of attaining patent rights.³³⁸ In contrast, the network paradigm perceives of patent communication as an independent end.³³⁹ This conclusion is derived from the communicating function element, drawing a theoretical distinction between the bulletin-board paradigm and the network paradigm. In particular, the former grasps patent communication as the price for patent rights, while the latter has a more complex understanding of patent communication. Specifically, such communication sometimes comprises a burden, sometimes a prize, and frequently a bit of both. Adopting the network paradigm's approach allows for a better explanation of the patent system, as the practice of early publication shows. Indeed, applicants will not gain patent rights as a result of requesting early publication, but that is not their goal. Early publication serves other interests, such as misleading competitors, creating a buzz in the capital

³³⁴ Glaeser & Landsman, *supra* note 25.

³³⁵ *See supra* Part III.A.1.

³³⁶ *See supra* notes 181–82 and accompanying text.

³³⁷ *See* Parts IV.B.1–2, 4 respectively.

³³⁸ *See supra* Part III.A.1; *supra* note 175.

³³⁹ *See supra* Part IV.A.1.

market,³⁴⁰ and acquiring consumer feedback.³⁴¹ Patent communication does not have to lead to a patent grant. Just like in the case of patent pledging,³⁴² there are many motives in requesting early publication, and the bulletin-board paradigm is looking for the wrong one.

Regarding the issue of early publication, the other two elements—multiple participants and the multi-directionality³⁴³—are at play as well. Given the multitude of interests and parties involved, it does not matter if early publication conveys patent-eligible information. The goal is to communicate through the patent medium, and the early publication practice delivers this goal. The multiplayer element, a linchpin in the network paradigm, supports this point: Even though the public (and traditionally, competitors and downstream inventors) may see none or merely minor legal and technical significance in early published information, other players, such as investors, tech-fans, and consumers, can take great interest in this information.

But why would one prefer to communicate particularly through the patent medium? The answer is that the patent medium contains a rare combination of various communicative features, which give a message of certain qualities that are hard to achieve through other media.³⁴⁴ The patent medium differs from a TV commercial or a press announcement, as patent communications—which, of course, do not necessarily substitute other communications but usually transpire in addition to them—offer unique effects, such as credibility, interactivity, a professional-technical context with legal orientation, (partial) official identification of participants, and a governmentally regulated platform.³⁴⁵ Each feature may be available elsewhere; however, a medium that combines them is quite rare.

³⁴⁰ See *supra* notes 63–64.

³⁴¹ See *supra* note 218.

³⁴² See *supra* notes 321–31.

³⁴³ See *supra* Parts IV.A.2, 4.

³⁴⁴ See a summary of the patent medium's characteristics in *supra* Table 1.

³⁴⁵ See *supra* notes 288–309.

3. Rethinking First-to-File

The bulletin-board paradigm explains partially the communicative implications of the FTF reform, focusing on expediting publication. This Article argues that the network paradigm provides a fuller explanation. Applying the element of different levels of access (i.e., private and public spheres)³⁴⁶ maintains that the FTF rule is not merely about the speed of patent communication but also about better quality and reliability of patent communication.

When discussing the levels of access element, this Article indicated how private channels—not only public ones—can affect patent communication. It now illustrates this point by reflecting upon the FTF rule through the private-public spheres, with a focus on the case of *secret prior art*.³⁴⁷ Under the FTI concept, an applicant was not entitled to a patent if the pertinent invention was already accomplished by another.³⁴⁸ This exclusion is inherent to the FTI concept, maintaining that the person eligible for a patent is the first to invent it. This situation led to an odd state of secret prior art:³⁴⁹ Applicants could not know, in principle, whether there is prior art—in the form of an invention in the possession of a first inventor—that blocks their patent application, as such prior art is discreet.³⁵⁰ Secret prior art impaired the trust and reliability of available prior art as it may not reflect reality, and more generally, prevented the patent medium from communicating the actual state-of-art.

Secret prior art is a particular case that emphasizes the possible detrimental effects of a private channel on patent communication in

³⁴⁶ See *supra* Part IV.B.3.

³⁴⁷ When using “secret prior art,” this Article refers to non-pending prior inventions and not the on-sale bar to prior art. See Pre-AIA, 35 U.S.C. § 102(f)–(g); *Helsinn Healthcare S.A. v. Teva Pharms. USA, Inc.*, 855 F.3d 1356, 1364 (Fed. Cir. 2017).

³⁴⁸ Activities under section 102(g)(2) do not count as prior art if the invention was abandoned, suppressed, or concealed. Indeed, that was a key exception to the first-to-invent: the second-to-invent could get the patent because the first to invent disqualified herself by abandoning, suppressing, or concealing the invention. This mitigates concerns over secret prior art to some extent (though it may be secret when created). See Pre-AIA, 35 U.S.C. § 102(g).

³⁴⁹ Another meaning of secret prior art is the knowledge found in pending patent applications, yet to be published. The discussion here, though, does not address this case.

³⁵⁰ See C. Douglass Thomas, *Secret Prior Art—Get Your Priorities Straight!*, 9 HARV. J.L. & TECH. 147, 150–51 (1996) (“[Secret prior art in the form of prior inventions of others] is inherent in a first-to-invent system.”).

general, as the network paradigm suggests. The secret prior art issue involves damage in terms of communication quality and reliability within the patent medium. The FTF rule solved, or at least significantly restricted,³⁵¹ the problem of secret prior art by simply dictating that the first inventor to file is the person eligible for a patent, regardless of any potential previous secret inventions.

Note that even under the FTF rule, there are some semi-discreet uses of an invention that are not known to the world at large but transpire as prior art;³⁵² still, the FTF rule mitigated dramatically the scope of secret prior art.³⁵³ Consequently, the FTF reform enhanced not only the speed but also the quality of patent communication.

CONCLUSION

The patent system is not just a platform for monetizing inventions or disseminating legal and technical information; it is an arena of communication—a medium. The patent medium enables participants to converse with each other in various and unique ways.

This Article argued that the present, implicit mindset toward the patent medium perceives of patent communication as linear and informative, consisting of few participants, with a particular focus on senders. This approach—defined here as the bulletin-board paradigm—covers patent communication only partially and fails to offer explanations for a variety of phenomena in patent law. Instead, this Article suggests adopting an alternative, transactional paradigm—the network paradigm. The network paradigm depicts patent communication as a continuous game, with multiple players, allowing messages to flow in many directions and under different levels of access. Importantly, instead of merely informing, the network paradigm suggests that the patent medium allows for a discourse.

The network paradigm's implications are tremendous, as demonstrated through the discussion of three sample phenomena.

³⁵¹ See *supra* notes 347, 349; Thomas, *supra* note 350, at 168 (“The novelty-only approach used by most countries together with a first-to-file system reduces this problem significantly.”).

³⁵² See *Helsinn Healthcare S.A.*, 855 F.3d at 1364.

³⁵³ See Thomas, *supra* note 350, at 168.

Indeed, this paradigm offers useful explanatory power that we can apply to better comprehend the patent system and its participants. Hence, this Article encourages scholars to apply the network paradigm to inspect other patent-related phenomena. Such implementation of the new paradigm will both deepen our understanding of patent law and scrutinize the network paradigm's potential and limitations.

Another, more general direction for future research is the interplay of law and communication. Beyond the narrow context of patent law, this Article indirectly raises more fundamental questions: what can we attain by thinking of and treating legal systems as a medium? What insights we can draw from the patent medium case to the broader law-communication context? Investigating these questions will benefit our understanding of not only patent communication but also the interface between law and communication in the broader sense.