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AGAINST DEFIBRILLATING THE API COPYRIGHT DEAD: A RESPONSE TO ADVOCATES OF COPYRIGHTABILITY OF SOFTWARE FUNCTIONAL SPECIFICATIONS

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I. INTRODUCTION

As this Special Issue of the HARVARD JOURNAL OF LAW & TECHNOLOGY confirms, the *Oracle v. Google*[1] litigation has revived a long dormant battle over the scope of copyright protection for computer software. That struggle, which raged from the mid-1980s through the mid-1990s, brought many of the contributors to this Special Issue together. Thus, this Issue has the feel of a reunion. Pam Samuelson, David Nimmer, and I wrote some of the early articles on these questions.[2] Jonathan Band worked with his then-colleague Michael Jacobs representing Fujitsu in its landmark software arbitration

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1. Oracle Am., Inc. v. Google Inc., 872 F. Supp. 2d 974 (N.D. Cal. 2012).

2. *See* Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663 (1984); Peter S. Menell, *Tailoring Legal Protection for Computer Software*, 39 STAN. L. REV. 1329 (1987); David Nimmer et al., *A Structured Approach to Analyzing the Substantial Similarity of Computer Software in Copyright Infringement Cases*, 20 ARIZ. ST. L.J. 625 (1988); Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045 (1989).

with IBM that focused on copyright and interoperability.[3] They were active in the formation and work of the American Committee for Interoperable Systems ("ACIS"),[4] which advocated for less protectionist intellectual property policies for computer software. Mark Lemley joined the party just as the first API copyright battle was subsiding.[5]

It is also nostalgic to see my good friend Annette Hurst participating in this Special Issue. Annette and I, along with Annette's Orrick colleague Joshua Rosenkranz, collaborated in the epic battle between Mattel and MGA over the Bratz dolls.[6] Opposite to us, Ralph Oman served as an expert witness for Mattel. As lead appellate counsel, Josh played a key role in persuading the Ninth Circuit to reverse the trial court's unwarranted constructive trust against MGA, earning him the noteworthy appellation "The Defibrillator" for his ability to revive companies "that appeared to be at death's door."[7] We proudly celebrated the Ninth Circuit decision vindicating fundamental copyright limitations that promote creativity and competition.[8]

Yet, there is something amiss about this reunion. Michael Jacobs, who participated in the LaST Frontier Conference on Copyright Protection of Computer Software and contended that "copyright law should clearly permit the independent development of compatible computer programs,"[9] served as lead trial counsel for the plaintiff in the first *Oracle v. Google* trial. Sun Microsystems and Oracle, who

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3. *See* JONATHAN BAND & MASANOBU KATOH, INTERFACES ON TRIAL: INTELLECTUAL PROPERTY AND INTEROPERABILITY IN THE GLOBAL SOFTWARE INDUSTRY 27–28 (1995).

4. *See* AMERICAN COMMITTEE FOR INTEROPERABLE SYSTEMS, Statement of Principles, Attachment to Letter from Peter M.C. Choy to Professor Barry E. Carter (Nov. 5, 1992), https://www.ccianet.org/wp-content/uploads/2014/10/ACIS-Letter-to-Clinton-Admin-1992.pdf [https://perma.cc/4ATT-MYGU] ("ACIS was created . . . to support policies and principles of intellectual property law providing for a careful balance between the goals of strong protection and rewards for innovation, and the goals of interoperability, fair competition and open systems.").

5. *See* Mark A. Lemley, *Convergence in the Law of Software Copyright?*, 10 HIGH TECH. L.J. 1 (1995); Mark A. Lemley & David McGowan, *Could Java Change Everything? The Competitive Propriety of a Proprietary Standard*, 43 ANTITRUST BULL. 715 (1998).

6. Somewhat like *Oracle v. Google*, the Bratz case dragged on for nearly a decade. *See* Tim Cushing, *It's Finally Over: 8 Years of Mattel vs. Bratz and No One's Getting Paid But the Lawyers*, TECHDIRT (Jan. 29, 2013), https://www.techdirt.com/articles/20121019/17344420768/its-finally-over-8-years-mattel-vs-bratz-no-ones-getting-paid-lawyers.shtml [https://perma.cc/XT64-PZQQ].

7. *See Litigators of the Year*, THE AMERICAN LAWYER (Jan. 1, 2012).

8. *See* Mattel, Inc. v. MGA Entm't, Inc., 616 F.3d 904 (9th Cir. 2010) (holding that "fashion dolls with a bratty look or attitude, or dolls sporting trendy clothing . . . are unprotectable ideas").

9. *See* Michael A. Jacobs, *Copyright and Compatibility*, 30 JURIMETRICS J. 91, 91 (1989). Jacobs concluded that "copyright law, if properly constructed, does permit the independent development of compatible programs." *Id*. at 91. He railed against the Third Circuit's *Whelan* decision's overbroad approach to copyright protection for computer software and emphasized that "[c]opyright law should protect only the *non*utilitarian aspects of a product. Compatibility requires the right to use *utilitarian* aspects." *Id*. at 103 (emphasis in original).

were among ACIS's founding and lead members, are now pushing for unusually strong and broad copyright protection for computer software. And my comrades from the Bratz litigation, which successfully fended off overbroad copyright claims for doll designs, are now advocating that copyright law robustly protect API declarations as though they were character names and chapter titles of HARRY POTTER novels.

Is this reunion a bad dream? Unfortunately, no. The legal profession has a way of distorting logic and principle in the name of zealous advocacy. In this response, I refute Mr. Oman's[10] and Ms. Hurst's[11] critique of my lead article[12] questioning *Oracle v. Google*'s resurrection of copyright protection for functional features of computer software.[13] Contrary to their assertions, I do not contend that APIs are not copyrightable. My position, grounded in Section 102(b) of the Copyright Act, the legislative history (including the CONTU Report), and Ninth Circuit precedent, is that the functional requirements of APIs, like the internal workings of other machines, are outside of copyright protection even as the implementing code for APIs is protectable.

II. CLARIFYING THE TERMS OF THE DEBATE

Both Mr. Oman and Ms. Hurst construct their critique of *Rise of the API Copyright Dead?* by erecting a strawman. According to Mr. Oman, I "implicitly embrace[] the view that Congress meant for the protection afforded computer software to be *different* from the protection afforded other works, because computer software is functional," and this leads me to contend that the Federal Circuit "erred at every turn."[14] Ms. Hurst reads my article to suggest that APIs are not creative, Sun Microsystems authorized companies to use the Java API

10. *See* Ralph Oman, *Computer Software As Copyrightable Subject Matter:* Oracle v. Google*, Legislative Intent, and the Scope of Rights in Digital Works*, 31 HARV. J.L. & TECH. (SPECIAL ISSUE) 639 (2018).

11. *See* Annette Hurst, *The Report of API Copyright's Death Is Greatly Exaggerated*, 31 HARV. J.L. & TECH. (SPECIAL ISSUE) 491 (2018).

12. *See* Peter S. Menell, *Rise of the API Copyright Dead?: An Updated Epitaph for Copyright Protection of Network and Functional Features of Computer Software*, 31 HARV. J.L. & TECH. (SPECIAL ISSUE) 303 (2018).

13. Due to space limitations, I will not comment on the other articles in the Special Issue other than to note, in response to the piece by Mr. Nimmer, that I have serious reservations about submitting fair use determinations to juries. *See* David Nimmer, *Juries and the Development of Fair Use Standards*, 31 HARV. J.L. & TECH. (SPECIAL ISSUE) 563 (2018). The ultimate fair use determination is a question of law. By resolving such questions by a jury, the public and appellate tribunals are denied any insight into the basis for the complex fair use balance. District judges should, in my view, limit a jury's role to discrete factual questions — if any — and reserve the ultimate fair use determination to themselves. In that way, the public and the appellate court can see the weighing of factors underlying the fair use determination.

14. *See* Oman, *supra* note 10, at 640 (emphasis in original).

without a license, and there is no copyright protection for API code.[15] Both Mr. Oman and Ms. Hurst conclude by contending that I predict that the Federal Circuit's decision will cause the sky to fall.[16]

None of these assertions is correct. My article comprehensively and faithfully presents the legislative process leading to Congress's recognition of copyright protection for computer software.[17] I agree with the Federal Circuit's holding that the Java API implementation attracts copyright protection.[18] I explain the development and coding of the Java APIs and recognize that they entail substantial creativity.[19] I dispassionately present the extensive interplay between Sun and Google over licensing of the Java APIs, including Oracle's trial slides depicting the two faces of Jonathan Schwartz.[20] None of my analysis turns on whether or not Sun consented to unlicensed use of the Java APIs.[21]

Thus, Mr. Oman, Ms. Hurst, and I agree about many of the underlying facts and several of the core legal issues underlying the API copyright battle. Nonetheless, we differ on two key issues: (1) the proper interpretation and application of copyright's limiting doctrines to functional specifications, particularly as construed by the Ninth Circuit; and (2) whether copyright law treats computer software differently than other works of authorship.

III. SECTION 102(b), CONTU, LEGISLATIVE HISTORY, AND NINTH CIRCUIT LAW

I concur with Mr. Oman and Ms. Hurst that computer software generally falls within the subject matter of copyright protection.[22]

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15. *See* Hurst, *supra* note 11, at 492–93.

16. *See* Oman, *supra* note 10, at 651; Hurst, *supra* note 11, at 516.

17. *See* Menell, *supra* note 12, at 315–18.

18. *See id*. at 435–38.

19. *See id*. at 347–54.

20. *See id*. at 355–71.

21. Ms. Hurst devotes a significant part of her article to discussing Google Android engineers' beliefs about whether a license was needed to use the Java API declarations. *See* Hurst, *supra* note 11, at 496–502. My article explores these issues as part of the corporate decision-making background. Although Oracle sought to use the Android engineers' emails about the need for licenses to embarrass the Google engineers, this chatter was largely tangential to the legal issues in *Oracle v. Google*, and Google's trial counsel was able to defuse it simply by pointing out that engineers are not lawyers. *See* Menell, *supra* note 12, at 404–05. Ms. Hurst also devotes significant attention to assessing whether scholars considered copyright protection for functional aspects of computer software to be unresolved. *See* Hurst, *supra* note 11, at 507–14. My principal point was simply to explain that by the late 1990s, API copyright litigation has subsided and that a norm had emerged within the software industry that functional specifications for interoperability were fair game. *See* Menell, *supra* note 12, at 342–44. It was this norm to which Jonathan Schwartz, Sun's CEO during the period that Android was being developed, testified. *See id*. at 395. My article fully exposes the consternation within Sun over Google's machinations. *See id*. at 344, 357–72.

22. *See* Menell, *supra* note 12, at 316 and n.44.

From there, however, we diverge. Both of them downplay the limitations reflected in Section 102(b) of the Copyright Act[23] and selectively discuss the legislative history referencing computer software and other significantly functional works, such as useful articles. Mr. Oman downplays and Ms. Hurst entirely disregards *Baker v. Selden*, the Supreme Court's seminal decision channeling protection between patent and copyright law.[24]

Rise of the API Copyright Dead? meticulously examines the pertinent legislative history,[25] including the statement that "Section 102(b) is intended, among other things, to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, and that the actual processes or methods embodied in the program are not within the scope of the copyright law."[26] My article also highlights CONTU's statement that "one is always free to make a machine perform any conceivable process (in the absence of a patent)."[27]

From these foundational sources, the rift grows wider when we reach the jurisprudence. The copyrightability of the Java API declarations litigated in *Oracle v. Google* turns on application of fundamental limitations on copyright protection set forth in Section 102(b) *as interpreted by Ninth Circuit* law.[28] Neither Mr. Oman nor Ms. Hurst take seriously this critical procedural posture. Whereas regional circuit courts of appeals are bound by their own and the Supreme Court's interpretation of applicable law, the Federal Circuit is obliged to operate differently when addressing legal issues outside of its core patent jurisdictional authority.[29] In establishing a specialized national appellate tribunal to harmonize patent jurisprudence and discourage regional forum shopping, Congress constrained the Federal Circuit's

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23. 17 U.S.C. §102(b) (2012) ("In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.").

24. 101 U.S. 99 (1879). It is telling that nowhere in Ms. Hurst's 25-page article is *Baker v. Selden* mentioned.

25. *See* Menell, *supra* note 12, at 315–17.

26. *See* H.R. REP. NO. 94-1476, at 57 (1976).

27. *See* NAT'L COMM'N ON NEW TECH. USES OF COPYRIGHTED WORKS, FINAL REPORT 20 (1979) [hereinafter CONTU REPORT]. Courts have treated the CONTU REPORT as legislative history to the 1980 amendments to the 1976 Act. *See* Vault Corp. v. Quaid Software Ltd., 847 F.2d 255, 260–61 (5th Cir. 1988); Apple Comput., Inc. v. Franklin Comput. Corp., 714 F.2d 1240, 1252 (3d Cir. 1983).

28. *See* Oracle Am., Inc. v. Google, Inc., 750 F.3d 1339, 1353 (Fed. Cir. 2014) (recognizing that "[w]hen the questions on appeal involve law and precedent on subjects not exclusively assigned to the Federal Circuit, the [Federal Circuit] applies the law which would be applied by the regional circuit" (quoting Atari Games Corp. v. Nintendo of Am., Inc., 897 F.2d 1572, 1575 (Fed. Cir. 1990)), and that "[c]opyright issues are not exclusively assigned to the Federal Circuit" (citing 28 U.S.C. § 1295 (2012).).

29. *See* Peter S. Menell, *API Copyrightability Bleak House: Unraveling and Repairing the* Oracle v. Google *Jurisdictional Mess*, 31 BERKELEY TECH. L.J. 1515, 1576–95 (2016).

independence by imposing regional circuit supremacy over non-patent subject matter.[30] Thus, Federal Circuit panels must apply the jurisprudence of the *regional* circuit where the patent case was filed. For *Oracle v. Google*, that means the Ninth Circuit precedent controlled.

It is surprising, therefore, that Mr. Oman and Ms. Hurst pay so little attention or respect to Ninth Circuit law and instead embrace the Third Circuit's approach in *Apple Computer, Inc. v. Franklin Computer Corp.*,[31] and *Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.*,[32] — particularly inasmuch as Ninth Circuit expressly disavowed *Whelan* "as simplistic and overbroad."[33] In fact, *Whelan*'s mode of analysis conflicts with Ninth Circuit law as well as the jurisprudence of most circuits that have addressed software copyright disputes.[34]

To the extent that Mr. Oman and Ms. Hurst address Ninth Circuit software copyright jurisprudence, they downplay and criticize the most pertinent case — *Sega v. Accolade*[35] — while emphasizing *Johnson Controls, Inc. v. Phoenix Control Sys., Inc.*,[36] a case of little significance that pre-dates *Sega*.[37] They also emphasize *Atari Games v. Nintendo*,[38] a Federal Circuit case that purports to apply Ninth Circuit law[39] but that was later superseded by *Sega* in the Ninth Circuit.[40] Even more fundamentally, their suggestion that *Sega* does not address copyrightability is flatly contradicted by the Ninth Circuit's unequivocal statement that the "functional requirements for compatibility with the Genesis [video game console are] aspects of Sega's programs that are not protected by copyright. 17 U.S.C. § 102(b)."[41] That statement provides the basis on which the court builds its fair use analysis. Thus, the case's essential holdings include both the uncopyrightability of

30. *See id*. at 1580–81.

31. 714 F.2d 1240 (3d Cir. 1983); *see* Oman, *supra* note 10, at 645.

32. 797 F.2d 1222 (3d Cir. 1986); *see* Hurst, *supra* note 11, at 511–12, 514.

33. *See* Sega Enters. v. Accolade, Inc., 977 F.2d 1510, 1522 (9th Cir. 1993) (citing Comput. Assocs. Int'l, Inc. v. Altai, Nos. 762, 91-7893, 91-7935, 1992 WL 139364 (2d Cir. June 22, 1992), *opinion withdrawn and superseded on rehearing by* 982 F.2d 693 (2d Cir. 1992)).

34. *See, e.g.*, Plains Cotton Coop. Assoc. v. Goodpasture Comput. Serv., Inc., 807 F.2d 1256, 1262 (5th Cir. 1987); Comput. Assocs. Int'l, Inc. v. Altai, 982 F.2d 693 (2d Cir. 1992); Gates Rubber v. Bando Chem. Indus., Ltd., 9 F.3d 823, 840 n.17 (10th Cir. 1993); *cf.* Lotus Dev. Corp. v. Borland Int'l, Inc., 49 F.3d 807 (1st Cir.1995), *aff'd without opinion by equally divided court*, 516 U.S. 233 (1996).

35. 977 F.2d 1510 (9th Cir. 1993); *see also* Menell, *supra* note 12, at 332–33. *Sega* was reinforced and extended by Sony Comput. Entm't, Inc. v. Connectix Corp., 203 F.3d 596 (9th Cir. 2000).

36. 886 F.2d 1173 (9th Cir. 1989).

37. *See* Menell, *supra* note 12, at 325–26.

38. 897 F.2d 1572 (Fed. Cir. 1990).

39. *See* Menell, *supra* note 12, at 330–31.

40. *Sega*, 977 F.2d at 1513 n.1; *see also* Menell, *supra* note 12, at 332–33.

41. *Sega*, 977 F.2d. at 1522.

functional specifications and that intermediate copying for purposes of deciphering such specifications qualifies for fair use.[42]

IV. SOFTWARE COPYRIGHT EXCEPTIONALISM IS BAKED INTO COPYRIGHT LAW; OR WHY HARRY POTTER NOVELS ARE NOT TREATED THE SAME AS FUNCTIONAL SPECIFICATIONS FOR MACHINES

Much of the dispute between Oracle's advocates and me boils down to the contention that *Rise of the API Copyright Dead?* rests on a faulty premise that computer software must be treated the same as all other copyrighted works, such as HARRY POTTER novels, operas, and paintings. Ms. Hurst characterizes my perspective as "software exceptionalism."[43]

Their critique misapprehends the essential design of federal copyright protection. Rather than develop a *sui generis* regime for computer software (which may well have been preferable with the benefit of hindsight (and foresight)),[44] Congress opted to place computer software within the same general regime that applies to most works of authorship, subject, of course, to the same fundamental limitations within the Copyright Act and jurisprudence that apply to all such works. Thus, like useful articles, maps, charts, directories, architectural works, accounting books, cookbooks, and other functional and factual works, computer software falls within the general copyright framework subject to the idea-expression dichotomy and other doctrines that afford balance and logically harmonize the larger intellectual property system.

According to the logic of Ms. Hurst's critique, the Supreme Court is guilty of "accounting exceptionalism" for its determination that the methods and systems described in Selden's accounting book are not protected by copyright law even though the book describing the accounting method is protected by copyright. Such tunnel vision overlooks the Supreme Court's appropriately and necessarily broader

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42. Furthermore, Ms. Hurst's critique of *Sega* mischaracterizes the facts. *See* Hurst, *supra* note 11, at 507–08. After selectively quoting a portion of the decision that states that Accolade created a manual that contained "only functional descriptions of the interface requirements and did not include any of Sega's code," *Sega*, 977 F.2d. at 1515, she asserts that "the parties apparently agreed that Accolade did not replicate any of the code in the commercial product." Hurst, *supra* note 11, at 508. Yet the next page of the opinion explains that Accolade included a 20–25 byte segment of Sega's Genesis code in its game programs so that these games could run on the Genesis device. *See Sega*, 977 F.2d. at 1515–16 ("According to Accolade employees, the header file is the only portion of Sega's code that Accolade copied into its own game programs. In 1991, Accolade released five more games for use with the Genesis III . . . All contained the standard header file that included the TMSS initialization code.").

43. *See* Hurst, *supra* note 11, at 405.

44. *See* Menell, *Tailoring Legal Protection for Computer Software*, *supra* note 2.

perspective in interpreting copyright law within the larger fabric of intellectual property law. Copyright protection (as well as trademark protection and design patent protection) have been appropriately cabined by statutory limitations and jurisprudence so as to ensure that functional advances, which are critical to free market competition and cumulative creativity,[45] are not monopolized unless the inventor can meet the relatively higher thresholds (novelty, non-obviousness, and disclosure) of the utility patent system.[46]

My critics' failure to grasp the larger picture blinds them to the distinction between API functional specifications (declarations) and implementing code. Relatedly, much of Ms. Hurst's "analysis" boils down to wordplay: by referring to declarations as "declaring code," she blurs the distinction between labels necessary for machine function and literary expression. But like the labels and columns of Selden's accounting forms, the particular functional specifications for the Java APIs are not protected by copyright because they are essential to operate a particular system or machine (specific Java API functions) even though the particular implementation code for those functional specifications is copyright-protected.

To make this point concrete, suppose that Sega had written its lockout code not as a peculiar 20–25 bytes of data[47] but rather as an original haiku or, better yet, an entire novel about young wizards. Even though that haiku or novel could well be protected if distributed as poetry or a book, it would be barred from copyright protection as lockout code. That is the reason for the Ninth Circuit's unmistakable statement in Sega that the "functional requirements for compatibility with the Genesis [video game console are] aspects of Sega's programs that are not protected by copyright. 17 U.S.C. § 102(b)."[48] As essential "gears and levers" for particular digital machines, the Java API declarations are not protectable under copyright law due to the overarching channeling principles reflected in Section 102(b) of the Copyright Act and *Baker v. Selden*.

It is for that reason that it is *irrelevant* that the Java APIs might be highly creative. So are haikus used as lockout code and all sorts of other functional devices. Technological creativity is among the most difficult and praiseworthy forms of creativity. Yet the overarching intellectual property system would be undermined if the inventor of a better digital water pump or arrangement of typewriter keys could bar

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45. *See* Peter S. Menell & Suzanne Scotchmer, *Intellectual Property Law*, *in* 2 HANDBOOK OF LAW AND ECONOMICS 1473, 1478–79, 1499–1500 (A. Mitchell Polinsky & Steven Shavell eds., 2007).

46. *See id.* at 1498, 1550; Baker v. Selden, 101 U.S. 99, 102–04 (1879); 17 U.S.C. §102(b) (2012).

47. *See Sega*, 955 F.2d at 1516.

48. *Id.* at 1522.

competition for life of the inventor plus 70 years by copyrighting the declarations (or functional specifications) for these devices. And therein lies the rub. Copyright does not stand alone as the sole means of promoting progress in computer software or mechanical inventions.[49] It is part of a larger intellectual property system that channels protection for functional features of machines and other useful articles into the utility patent regime.

Mr. Oman acknowledges that:

> In a limited sense, Menell's suggestion that the functionality of the declarations and their expression cannot be separated is of course correct: if the 'function' to be achieved is framed as 'the ability to write software code using the precise phraseology that the original author created,' then it is in fact an *a priori* truth that there is no way to achieve *that* function except by including the same phraseology in the follow-on work. But the Copyright Act has never sanctioned such a tautological approach to defining the 'function' . . . .[50]

This is hardly a tautology and the *Sega* decision authorizes this very activity.[51] If Sega independently creates and uses "Though still unravish'd bride of quietness, Thou foster-child of silence and slow time, Sylvan historian, who canst thus express A flowery tale more sweetly

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49. As Professor Paul Goldstein poignantly expressed:

> Science and technology are centripetal, conducing toward a single optimal result. One water pump can be better than another water pump, and the role of patent and trade secret law is to direct investment toward such improvements. Literature and the arts are centrifugal, aiming at a wide variety of audiences with different tastes. We cannot say that one novel treating the theme, say, of man's continuing struggle with nature is in any ultimate sense 'better' than another novel — or musical composition or painting — on the same subject. The aim of copyright is to direct investment toward abundant rather than efficient expression. Bradley Efron, of Stanford's Statistics Department, captured this difference wonderfully when he observed that, 'If Shakespeare had died as a child we should never have had *Hamlet*, but if Newton had died as a child we should certainly have calculus today. Of course, that is also the great advantage of science. Having seen the calculus, one can improve on it, but it is hard to imagine an improved *Hamlet*.'

Paul Goldstein, *Infringement of Copyright in Computer Programs*, 47 U. PITT. L. REV. 1119, 1123 (1986) (quoting Stan. U. Campus Rep., May 2, 1984, at 5–6).

50. Oman, *supra* note 10, at 647 (emphasis in original).

51. Since computer software is inherently functional, Congress's decision to bring computer software within the scope of copyright protection requires some pragmatism. Thus, the runtime (or execution time) for different implementations will inevitably vary. I would not, however, view this to be a basis for treating the implementation code as essential to function unless identical runtime is essential to a machine's function.

than our rhyme,"[52] as the access code for its game controller, then others would be free to use this lovely quatrain even though countless other alphanumeric codes or poems could function as lock-out code.

Similarly, Sun's devising of a package (java.security) using a particular class name (ProtectionDomain) and method name (ClassLoader) to effectuate a machine that responds to particular inputs and produces particular outputs moves the creative names and essential structure outside of copyrightability, thereby enabling others (in the absence of a utility patent covering this process or machine) to emulate (and interoperate with) this machine so long as they write their own implementation. In this way copyright stands in the way of pirating and allows Sun some valuable lead-time, while promoting competition and cumulative creativity. Furthermore, it channels technological advances in processes and machines into the utility patent system, which is better calibrated (with higher validity thresholds and shorter duration) to promote technological advance.

Mr. Oman and Ms. Hurst are undoubtedly correct that functionality and expressiveness can coexist.[53] But copyright protection for essential functional elements cannot exist. That is the subtle, yet critically important, lesson of *Baker v. Selden* and *Sega v. Accolade*. The plot structure of a novel[54] and selection and arrangement of recipes[55] are not like the gears and levers, or digital access codes, of a machine. Just as courts are called upon to assess levels of abstraction,[56] they are capable of distinguishing between essential functional specifications for machines and purely expressive works of authorship. As the Supreme Court explained in *Baker v. Selden*:

> The copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds, or to the diagrams which he employs to explain them, so as to prevent an engineer from using them whenever occasion requires. The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book. And where the art it teaches cannot

52. John Keats, *Ode on a Grecian Urn*, ANNALS OF THE FINE ARTS No. 15, Jan. 1820 (published anonymously); *see* Sheldon v. Metro-Goldwyn Pictures Corp., 81 F.2d 49, 54 (2d. Cir. 1936).

53. *See* Oman, *supra* note 10, at 644–46; Hurst, *supra* note 11, at 494–95.

54. *See* Hurst, *supra* note 11, at 504–05.

55. *See* Oman, *supra* note 10, at 650.

56. *See* Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930); Hurst, *supra* note 11, at 506.

> be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public; not given for the purpose of publication in other works explanatory of the art, but for the purpose of practical application.
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> Of course, these observations are not intended to apply to ornamental designs, or pictorial illustrations addressed to the taste. Of these it may be said, that their form is their essence, and their object, the production of pleasure in their contemplation. This is their final end . . . .[57]

V. NOT SO FINAL WORDS

As this Special Issue highlights, advances in science and technology have moved the realms of engineering and art closer, making the distinctions between technological and expressive creativity all the more important. The resilience and efficacy of the copyright system depend critically upon the judiciary's comprehension of technology and its ability to interpret copyright law's standards in light of the structure and overarching principles governing the intellectual property system as a whole.[58]

The dawn of the computer age — like the advent of photography, player pianos, phonograms, motion pictures, broadcasting, and audio and video copying — has challenged the judiciary's capacity to fit new technology into copyright law. As the lead article to this Special Issue chronicles, the courts struggled mightily with this task in the 1980s. As they gained better understanding of the functional character of computer software, however, they were able, drawing upon the foundational principles reflected in *Baker v. Selden* and Section 102(b) of the Copyright Act, to weave legal protection for computer software into the intellectual property system tapestry.

The Federal Circuit's 2014 *Oracle v. Google* decision unfortunately undermined the balanced regime that had emerged and threatens to turn the clock back to the "simplistic and overbroad" standards

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57. Baker v. Selden, 101 U.S. 99, 103–04 (1879).

58. *See* Peter S. Menell, *The Mixed Heritage of Federal Intellectual Property Law and Ramifications for Statutory Interpretation*, *in* INTELLECTUAL PROPERTY AND THE COMMON LAW 63 (Shyamkrishna Balganesh ed., 2013); Peter S. Menell, *Envisioning Copyright Law's Digital Future*, 46 N.Y.L. SCH. L. REV. 63 (2002).

of the 1980s.[59] As much as I would like to believe that this vigorous scholarly debate will restore the sound jurisprudence that had taken hold by the late 1990s, there is little reason to believe that such amelioration is likely in the near future.

The Federal Circuit's resolution of the second *Oracle v. Google* appeal will not erase the fundamental mistakes of its 2014 copyrightability ruling. Furthermore, Oracle can file a new action based upon Google's implementations of Android in devices other than smartphones and tablets.[60] Without Supreme Court intervention — which would add additional uncertainty — the Federal Circuit's copyrightability jurisprudence will continue to distort the intellectual property system and the software industry.

Perhaps one other thing on which we can all agree is that there will be more reunions as the second API Copyright War continues to unfold.

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59. *See* Sega Enters. v. Accolade, Inc., 977 F.2d 1510, 1522 (9th Cir. 1993) (citing Comput. Assocs. Int'l, Inc. v. Altai, 1992 WL 139364 (2d Cir. June 22, 1992), *opinion withdrawn and superseded on rehearing by* 982 F.2d 693 (2d Cir. 1992)).

60. *See* Menell, *supra* note 12, at 412; Order Denying Renewed Motion for Judgment as a Matter of Law and Motion for a New Trial, Oracle Am., Inc. v. Google Inc., 2016 WL 5393938 (N.D. Cal. Sept. 27, 2016) (No. C 10-03561 WHA). Interestingly, unless Oracle were to lodge new patent claims, that case would fall within the Ninth Circuit's, as opposed to the Federal Circuit's, appellate jurisdiction.