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Class Action Notice in the Digital Age

Alexander W. Aiken

COMMENT

CLASS ACTION NOTICE IN THE DIGITAL AGE

ALEXANDER W. AIKEN†

Technology is advancing dramatically each year, reshaping our society in the process. Despite these rapid changes, however, many federal courts continue to rely on traditional means of disseminating notice, including mail and newspapers, to inform class action members of their rights. As technology continues to progress in the digital age, these methods are becoming increasingly anachronistic. Inadequate notice risks a class member not learning of the action, and failing to learn of an action risks an individual losing a potentially large claim. Moreover, inadequate notice may open a judgment or settlement to direct or collateral attack.

Recognizing limitations in traditional forms of notice, some courts and parties have begun using modern technologies. They are using email notice to deliver individual notice, and banner and pop-up advertisements on websites, as well as dedicated websites, to try to reach unknown class members. Although these efforts are a promising first step, courts and parties can do more. For example, machine learning systems—which analyze massive accumulations of data to discern unobserved patterns—could be used to identify previously unknown class members, with the ultimate goal of sending them individual notice. Social media also offers an inexpensive way for parties to reach a potentially vast, diverse class. Finally, text messaging could allow parties to deliver notice directly to class members in a matter of seconds. In the digital age, it is imperative that courts and parties harness modern technologies to provide the best notice practicable and protect the interests of class members.

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INTRODUCTION

Technological innovations are reshaping our society in profound ways. Cellphones, laptops, and tablets are becoming smaller, sleeker, and faster.[1] We can now communicate with millions across the globe instantly with the click of a mouse.[2] Social media has helped to spark revolutions.[3] Organizations are using huge amounts of data to better understand and reach consumers with increasingly targeted advertisements.[4] We may even be able to communicate telepathically one day.[5] All of this is to say that we live in a world where yesterday's science fiction is increasingly becoming contemporary reality.

Despite the dramatic technological innovations of the last few decades, however, many federal judges and practitioners continue to rely on traditional means of disseminating notice, including mail[6] and newspapers,[7] to inform class members of their rights. These methods of disseminating notice are becoming anachronistic. As one notice expert has commented,

> When people running businesses advertise, they actually desire to inform their intended audiences, and they do so with marketing campaigns that are designed to grab attention, be understood, and acted upon. They do not run small ads in the back of newspapers or send mailings in "fine-print" to last-known addresses captured many years ago. Unfortunately, this approach passes muster for class action notices in too many courts.[8]

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1 *See, e.g.*, Jordan Kahn, *Apple Unveils the New iPhone 7 & 7 Plus, Preorders Start Sep. 9*, 9 TO 5 MAC (Sept. 7, 2016), https://9to5mac.com/2016/09/07/apple-unveils-iphone-7 [https://perma.cc/4QUQ-66ZV] (discussing the new features of the iPhone 7 and the iPhone 7 Plus).

2 *See* INTERNET LIVE STATS, http://www.internetlivestats.com [https://perma.cc/6E6F-NG7M] (showing that there are over three billion internet users worldwide).

3 *See, e.g.*, Catherine O'Donnell, *New Study Quantifies Use of Social Media in Arab Spring*, U. WASH.: UW TODAY (Sept. 12, 2011), http://www.washington.edu/news/2011/09/12/new-study-quantifies-use-of-social-media-in-arab-spring [perma.cc/PGK8-NART] (detailing a study that analyzed the importance of social media during the Arab Spring).

4 *See, e.g.*, Reed Albergotti, *Facebook to Target Ads Based on Web Browsing*, WALL ST. J. (June 12, 2014), http://www.wsj.com/articles/facebook-to-give-advertisers-data-about-users-web-browsing-1402561120 [https://perma.cc/Q3PU-HJ9C] (discussing how Facebook collects data to target advertisements to users).

5 *See* Caitlin Dewey, *Mark Zuckerberg Says the Future of Communication is Telepathy. Here's How that Would Actually Work.*, WASH. POST (July 1, 2015), https://www.washingtonpost.com/news/the-intersect/wp/2015/07/01/mark-zuckerberg-says-the-future-of-communication-is-telepathy-heres-how-that-would-actually-work [https://perma.cc/965X-QMW9] (analyzing the possibility of telepathic communication).

6 *See, e.g.*, Ontiveros v. Zamora, 303 F.R.D. 356, 367 (E.D. Cal. 2014) (approving a notice plan where the settlement administrator sent notice to the last known addresses, as reflected in the National Change of Address database, of class members).

7 *See, e.g.*, Hughes v. Kore of Ind. Enter., 731 F.3d 672, 677 (7th Cir. 2013) (finding publication in local newspapers to be the best notice practicable because of the difficulty in identifying members of that particular class—persons who had used two ATM machines).

8 Todd B. Hilsee et al., *Hurricanes, Mobility, and Due Process: The "Desire-to-Inform" Requirement for Effective Class Action Notice Is Highlighted by Katrina*, 80 TUL. L. REV. 1771, 1783 (2006). Hilsee

Failing to employ the best means of notice risks a class member not learning of the litigation, and "a person who doesn't hear about a class action that includes him/her loses his/her property rights—potentially for a very big claim."[9] Inadequate notice may also open a judgment or settlement to direct or collateral attack.[10] It is therefore imperative that courts and parties use the best available means to disseminate notice to class action members. Unfortunately, the traditional means widely employed do not suffice in the modern world.

Recognizing the limits of traditional methods of providing notice, some courts and parties have started employing modern technologies, particularly the internet, to deliver notice. Email notice is becoming more common, especially in class actions involving internet companies.[11] Banner and pop-up advertisements on websites have begun supplanting newspapers as the preferred means of trying to notify unknown class members of their rights.[12] And websites created solely to provide information on a given class action have become a mainstay of notice practices.[13] With the growing importance of the internet, these methods of disseminating notice are likely here to stay and will only expand going forward.[14] Courts and parties should be receptive to them.

But courts and parties can do more. Recent technological innovations offer new means of ensuring that class members receive the "best notice that is practicable under the circumstances."[15] Machine learning systems are a relatively new technology capable of analyzing large accumulations of data to

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"was the first person judicially recognized as an expert on class action notice in published decisions in the United States and in Canada." HILSEE GROUP LLC, http://www.hilseegroup.org/toddbio.php [https://perma.cc/FQQ5-4NYB].

9 Hilsee et al., *supra* note 8.

10 *See id.* at 1804 (noting that a person can challenge the settlement's binding effect in a different court after its effective date has passed and "after the defendant's money has been paid out," by "arguing that he/she did not receive proper notice and therefore [is] not bound by its result").

11 *See, e.g.*, Noll v. eBay, Inc., 309 F.R.D. 593, 601 (N.D. Cal. 2015) (approving eBay's plan to disseminate notice to class members using email addresses possessed by the company, and by direct mail notice if the emails were undeliverable).

12 *See, e.g.*, *In re* Briscoe, 448 F.3d 201, 207 (3d Cir. 2006) (affirming the trial court's decision to allow a notice plan including "banner advertisements on the Internet directing class members to the official settlement website," where the proposed class included "all persons in the United States, including their representatives and dependents, who had ingested [a particular diet drug]").

13 *See, e.g.*, Wallace v. Powell, 301 F.R.D. 144, 159 (M.D. Pa. 2014) (approving a notice plan that included the use of a detailed website to provide information on the class action); *In re* HP Inkjet Printer Litig., No. 5:05-cv-3580, 2011 WL 115863, at *3 (N.D. Cal. Mar. 29, 2011) (approving a notice plan where notice would be emailed to 13 million class members, published in popular magazines, and placed on a dedicated website); *In re* Glob. Crossing Sec. & ERISA Litig., 225 F.R.D. 436, 449 (S.D.N.Y. 2004) (approving a notice plan that included the creation of a class action website).

14 *See* Robert H. Klonoff, *Class Actions in the Year 2026: A Prognosis*, 65 EMORY L.J. 1569, 1650-51 (2016) (predicting that courts and parties will increasingly use the internet to disseminate notice in the coming years—a trend that has already begun).

15 FED. R. CIV. P. 23(c)(2)(B).

detect unobserved patterns. In the context of class action notice, these systems could help courts and parties find previously unidentified class members, with the end goal of providing individual notice. They could also help parties to tailor notice plans to a given class's media uses. In addition, social media could provide an inexpensive way for parties to reach a potentially large and diverse class. And finally, text messaging could allow parties to deliver notice to class members directly and in a matter of seconds. In the digital age, courts and parties should harness these technologies to improve notice plans and protect the interests of class members.

This Comment proceeds as follows. Part I sets forth the standards that govern class action notice. Part II examines how courts have traditionally provided notice. The discussion focuses on standard mail, newspapers, magazines, television, and radio. I argue that, although these forms of notice have continuing usefulness in certain instances, they also have limitations that courts and parties can and should address through the use of modern alternatives.

Part III discusses the ways in which courts and parties are using new technologies, particularly the internet, to provide notice. I review courts' increasing reliance on email to provide individual notice to class members. I also discuss the ways in which courts and parties are utilizing banner and pop-up advertisements, keyword search results, and dedicated websites to supplement individual notice and/or provide constructive notice. I ultimately argue that these forms of notice should be the focal point of notice plans going forward because they allow class counsel to target notice to individual persons, they are relatively inexpensive, they generally reach larger audiences, and they allow greater interactivity between class members and class counsel.

Part IV then discusses relatively new technologies that courts and parties should consider using, or should use with greater regularity. I focus first on machine learning systems and argue that courts and parties can use this technology not only to identify potential class members, but also to determine the best means of reaching them. I also argue that courts and parties should use social media and text messaging more frequently to supplement notice.

This Comment concludes with an examination of a proposed change to Federal Rule of Civil Procedure 23 that, if adopted, would explicitly authorize courts to provide notice electronically. I fully endorse the current wording and the overall sentiment driving the amendment. It makes clear that courts and parties *ought* to embrace electronic notice, both when trying to provide individual notice and when trying to provide supplemental or constructive notice. In conclusion, I suggest that, because it is impossible to know how technological advances will shape communication in the future, courts must be willing to embrace new technologies as they develop and become widespread.

I. THE STANDARDS GOVERNING CLASS ACTION NOTICE

To understand the different mediums through which courts and parties disseminate notice to class members, some background is necessary. In federal court, class action notice plans are subject to two interrelated requirements. First, the program must meet the requirements of Federal Rule of Civil Procedure 23 (Rule 23).[16] Second, and underlying the requirements of Rule 23, the program must satisfy certain constitutional considerations of procedural due process.[17]

It is imperative that parties satisfy these requirements; otherwise, a judgment or settlement may be open to direct[18] or collateral attack,[19] undermining its finality. Failing to provide adequate notice may also deprive class members of substantial property rights, as a class member who is unaware of the action might be unable to exercise rights arising from it.[20] For these reasons, litigants cannot treat notice decisions lightly.

A. *Rule 23*

Rule 23 governs class action procedure in federal court, including the provision of notice. When a court certifies a class under Rule 23(b)(1)[21] or 23(b)(2),[22] it is left to the court's discretion whether to order notice of certification.[23] Commentators have remarked that notice is discretionary in

16 *See infra* Section I.A.

17 *See infra* Section I.B.

18 *See* WILLIAM B. RUBENSTEIN, NEWBERG ON CLASS ACTIONS § 8:36 (5th ed. 2013) ("During the initial run of a case, the sufficiency of the method(s) of notice may be challenged when the court evaluates notice plans in the first instance, when class members attempt to opt out of the class action after a court-created deadline or as part of an inquiry into whether a settlement is fair and adequate." (citations omitted)).

19 *See id*. ("[A]s notice is rooted in the Constitution's due process protections, class members may attempt to avoid the binding effect of the class judgment by collaterally attacking the constitutional sufficiency of the initial case's notice program." (citations omitted)).

20 *See* text accompanying note 9.

21 Rule 23(b)(1) allows for class certification where "prosecuting separate actions by or against individual class members would create a risk of . . . inconsistent or varying adjudications with respect to individual class members that would establish incompatible standards of conduct for the party opposing the class," or where "adjudications with respect to individual class members that, as a practical matter, would be dispositive of the interests of the other members not parties to the individual adjudications or would substantially impair or impede their ability to protect their interests." FED. R. CIV. P. 23(b)(1)(A)–(B).

22 Rule 23(b)(2) allows for class certification where "the party opposing the class has acted or refused to act on grounds that apply generally to the class, so that final injunctive relief or corresponding declaratory relief is appropriate respecting the class as a whole." FED. R. CIV. P. 23(b)(2).

23 FED. R. CIV. P. 23(c)(2)(A). It seems prudent here to note that there is an ongoing debate about whether due process requires notice and opt-out rights in (b)(1) and (b)(2) class actions involving money damages. *See generally* CHARLES ALAN WRIGHT ET AL., FEDERAL PRACTICE AND PROCEDURE § 1786 (3d ed. 2015); Robert H. Klonoff, *Class Actions for Monetary Relief Under*

such class actions for a few reasons. First, class members cannot opt out of these so-called "mandatory" classes.[24] It is thought, therefore, that providing notice "serve[s] little function."[25] Second, classes in such actions are generally thought to be "cohesive" insofar as members share similar interests.[26] "[T]he importance of providing individualized notice [therefore] recedes," as class members have less of a need to protect their interests individually.[27] In other words, because all members are in it together, individual notice is less essential. Third, class members in mandatory class actions may have relationships predating the creation of the class, such that they may already have notice of the pending action, mitigating the need for formal notice at all.[28]

In contrast to (b)(1) and (b)(2) classes, when a court certifies a class under Rule 23(b)(3),[29] the court is to "direct to class members the best notice that is practicable under the circumstances."[30] The court must also provide "individual notice to all members who can be identified through reasonable effort."[31] Some commentators have argued that notice is mandatory in (b)(3) actions because these classes are thought to lack the cohesion of (b)(1) and (b)(2) classes, and perhaps more importantly, "with money damages at stake, class members are entitled to opt out and must have notice of the case to do so."[32] Opt out rights are important when monetary damages are at stake because some class members may feel that they can get more through individual litigation rather than in a class action where any damages will be apportioned ratably among all members. Others have pointed out that the mandatory notice provision in Rule 23 for (b)(3) actions arose out of a compromise within the 1966 Advisory Committee meant to address "the expressed concern that (b)(3) classes might be used by class counsel, in league with defendants, to force those with substantial individual claims into group litigation inimical to their

Rule 23(b)(1)(A) and (b)(1)(B): Does Due Process Require Notice and Opt-Out Rights?, 82 GEO. WASH. L. REV. 798 (2014). This Comment flags the debate without taking a position.

24 *See* RUBENSTEIN, *supra* note 18, § 4.48 (noting that "(b)(1) [and (b)(2)] classes are mandatory, while (b)(3) classes require notice and opt out rights").

25 *Id.* at § 8:3.

26 *Id.*

27 *Id.*

28 *See id.* (noting that members of a mandatory class action "will at times have a prelitigation social relationship with one another . . . that may enable knowledge of a shared lawsuit to circulate without formal notice").

29 Rule 23(b)(3) permits class certification where "the court finds that the questions of law or fact common to class members predominate over any questions affecting only individual members, and that a class action is superior to other available methods for fairly and efficiently adjudicating the controversy." FED. R. CIV. P. 23(b)(3).

30 FED. R. CIV. P. 23(c)(2)(B).

31 *Id.*

32 RUBENSTEIN, *supra* note 18, § 8:5.

interests."[33] In other words, the argument is that notice and opt out rights are required in (b)(3) classes to mitigate the concern that plaintiffs' counsel would settle a class action for less than the value of the claims and thereby harm class members in hopes of obtaining a lucrative award of attorneys' fees. Presumably, the right to opt out allows class members to avoid being bound by settlements detrimental to their interests.

In addition to requirements regarding the means of dissemination, notice in (b)(3) actions must meet certain form and content requirements. Specifically, the notice must "clearly and concisely state in plain, easily understood language"

> (i) the nature of the action; (ii) the definition of the class certified; (iii) the class claims, issues, or defenses; (iv) that a class member may enter an appearance through an attorney if the member so desires; (v) that the court will exclude from the class any member who requests exclusion; (vi) the time and manner for requesting exclusion; (vii) and the binding effect of a class judgment on members under Rule 23(c)(3).[34]

Finally, when parties to a class action submit a proposed settlement to the court for review,[35] Rule 23 requires the court to "direct notice in a reasonable manner to all class members who would be bound by the proposal."[36] If a court has certified a (b)(3) class for purposes of settlement, notice must meet the more stringent requirements of (b)(3) certification.[37] Because many class actions involve (b)(3) classes and the more stringent "best notice practicable" standard, this Comment will analyze different methods of notice under that standard.[38]

B. *Due Process*

In addition to the requirements of Rule 23, class action notice must meet certain due process requirements. The Supreme Court articulated these requirements in *Mullane v. Central Hannover Bank and Trust Company*, holding,

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33 Stephen B. Burbank, *The Class Action Fairness Act of 2005 in Historical Context: A Preliminary View*, 156 U. PA. L. REV. 1439, 1488 (2008).

34 FED. R. CIV. P. 23(c)(2)(B)(i)–(vii).

35 Rule 23 provides that "[t]he claims, issues, or defenses of a certified class may be settled, voluntarily dismissed, or compromised only with the court's approval." FED. R. CIV. P. 23(e). The court may approve the settlement "only after a hearing and on finding that it is fair, reasonable, and adequate." FED. R. CIV. P. 23(e)(2).

36 FED. R. CIV. P. 23(e)(1).

37 *See, e.g.*, Saini v. BMW of N. Am., LLC, No. 12-6105, 2015 WL 2448846, at *13 (D.N.J. May 21, 2015) ("[W]here a settlement class has been conditionally certified under Rule 23(b)(3) and a proposed settlement conditionally approved, proper notice must meet the requirements of Federal Rules of Civil Procedure 23(c)(2)(B) and 23(e).").

38 An analysis of (b)(3) classes is particularly instructive because a notice program satisfying this onerous requirement should suffice in other situations.

> An elementary and fundamental requirement of due process in any proceeding which is to be accorded finality is notice reasonably calculated, under all the circumstances, to apprise interested parties of the pendency of the action and afford them an opportunity to present their objections. The notice must be of such nature as reasonably to convey the required information, and it must afford a reasonable time for those interested to make their appearance.[39]

The Court went on to specify that the use of means likely to result in actual notice, such as individual notice, satisfy this standard.[40] When parties cannot identify the individuals to be bound by the judgment with reasonable effort, the chosen means of notice may be any means "not substantially less likely to bring home notice than other of the feasible and customary substitutes."[41] Based on these considerations, the Court in *Mullane* required the parties to mail individual notice to those members of the trust at issue with known addresses.[42] For those whose addresses could not be found with due diligence, the Court held that notice by publication sufficed as a common form of substitute notice.[43]

Following *Mullane*, the Supreme Court specifically addressed the due process considerations of class action notice in *Eisen v. Carlisle & Jacquelin*.[44] There, the district court had found that the parties could identify approximately 2,250,000 class members with reasonable effort.[45] It also found that the parties could mail notice to these individuals at a cost of ten cents per member, totaling $225,000.[46] The district court held, however, that neither due process nor Rule 23 required such a "substantial" expenditure.[47] It instead ordered the parties to provide partial individual notice, with the defendant covering ninety percent of the costs.[48] The U.S. Court of Appeals for the Second Circuit reversed, holding that Rule 23 required individual notice to be sent to *all* identifiable class members, with the entire cost to be borne by the plaintiff.[49]

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39 339 U.S. 306, 314 (1950) (citations omitted).

40 *See id.* at 315 ("The means employed must be such as one desirous of actually informing the absentee might reasonably adopt to accomplish it. The reasonableness and hence the constitutional validity of any chosen method may be defended on the ground that it is in itself reasonably certain to inform those affected . . . .").

41 *Id.*

42 *Id.* at 318.

43 *Id.* at 317.

44 417 U.S. 156 (1974).

45 *Id.* at 166-67.

46 *Id.* at 167.

47 *Id.*

48 *Id.* at 168.

49 *Id.* at 169.

Ultimately, the Supreme Court agreed with the Second Circuit. It found that "the names and addresses of 2,250,000 class members [were] easily ascertainable, and there [was] nothing to show that individual notice [could not] be mailed to each."[50] The Court then stated explicitly that "individual notice to identifiable class members is not a discretionary consideration to be waived in a particular case . . . . [E]ach class member who can be identified through reasonable effort must be notified . . . ."[51] Rejecting publication notice as a "poor substitute for actual notice"[52] under the circumstances, the Court further required the plaintiff to "bear the cost of notice to the members of his class."[53]

Thus, Rule 23 and the requirements of due process closely mirror one another in the class action context. Indeed, it is clear that the drafters of Rule 23 wrote it in such a way as to "maximize the likelihood (subject to reasonable limitations) that absent class members whose rights will be determined by the judgment of the court will receive notice of the proceedings and their rights in accordance with the principle of due process inherent in the Fifth and Fourteenth Amendments."[54] Both Rule 23 and considerations of procedural due process require courts to direct individual notice to those class members who can be identified with reasonable effort. Where individual notice cannot be effectuated, courts are to use the best available substitute method of notice. With these requirements in mind, I now examine the various ways in which courts notify class members of their rights, beginning with traditional mediums of communication.

II. TRADITIONAL METHODS OF PROVIDING NOTICE AND THEIR CONTINUED USE

As the following Sections will detail, courts have traditionally allowed parties to send individual notice to all identifiable class members through standard mail. They have also used newspaper and magazine publications, television broadcasts, and radio announcements to supplement individual notice, or to provide constructive notice where the names of class members are not reasonably ascertainable. Many courts and parties continue to adhere to these traditional means of disseminating notice, despite the dramatic

50 *Id.* at 175.

51 *Id.* at 176.

52 *Id.* at 175.

53 *Id.* at 177. The Court's holding in this respect does not mean that a plaintiff must *always* bear the costs of providing notice. Courts have developed several doctrines that permit cost shifting. For a general overview of these doctrines, see RUBENSTEIN, *supra* note 18, § 8:33. In the specific context of settlement notice, courts generally allow parties to negotiate which side will bear the cost of notice. *Id.* at § 8:34.

54 Brian Walters, *"Best Notice Practicable" in the Twenty-First Century*, UCLA J. L. & TECH., Spring 2003, at 1, 4.

technological innovations of the last few decades. They do so not because these means are inherently superior to modern alternatives, but rather because of longstanding precedent and convention. In so doing, courts may fail to fully account for the significant limitations of traditional media, which means that the notice program may not be the best practicable.

A. *Standard Mail*

Standard mail is perhaps the most important means by which courts and parties have traditionally disseminated notice, and its popularity continues today. Typically, a party to the litigation or a class action notice expert[55] sends individual notice by first-class mail to the last known addresses of class members.[56] To maximize the effectiveness of the notice program, addresses on the class list are checked against the United States Postal Service's National Change of Address Database (NCOA Database). Parties use the database, developed based on change of address form submissions,[57] in an attempt to find class members' most recent addresses for notice purposes.[58] If the postal service returns a notice as undeliverable, the party or expert will then try to find a new address for the class member and send notice there.[59]

As an offshoot of traditional mail notice, courts have also permitted parties to mail postcards containing notice to class members in order to reduce costs, so long as the postcards clearly indicate how to obtain more detailed information.[60] Similarly, courts have allowed parties to save postage costs by including individual notice in the monthly billing statements of class members

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55 A number of companies specialize in providing notice to class members, and parties often hire them to do so. One such company is Hilsoft Notifications, which notes that it has "design[ed] and implement[ed] notice programs in many of the largest and most significant cases in history." HILSOFT NOTIFICATIONS, http://www.hilsoft.com [https://perma.cc/G4CC-HGTE].

56 *See, e.g.*, Ontiveros v. Zamora, 303 F.R.D. 356, 367 (E.D. Cal. 2014) (approving notice by mail to the last known addresses of class members); Harlan v. Transworld Sys., Inc., 302 F.R.D. 319, 331 (E.D. Pa. 2014) (same); Lizondro-Garcia v. Kefi LLC, 300 F.R.D. 169, 180-81 (S.D.N.Y. 2014) (same); Tijero v. Aaron Bros., Inc., 301 F.R.D. 314, 325-26 (N.D. Cal. 2013) (same); Passafiume v. NRA Grp., LLC, 274 F.R.D. 424, 431 (E.D.N.Y. 2010) (same); Vasquez v. Coast Valley Roofing, Inc., 670 F. Supp. 2d 1114, 1126-27 (E.D. Cal. 2009) (same).

57 *See Keep in Touch With Your Valuable Customers With the National Change of Address Database*, MELISSA DATA, https://www.melissadata.com/articles/keep-in-touch-with-your-valuable-customers-with-the-national-change-of-address-database.htm [https://perma.cc/ZHH8-5KLB] ("When people or businesses move, they usually submit their moving information to the USPS. In turn, the USPS enters their moving information into the comprehensive national change of address database.").

58 Hilsee, *supra* note 8, at 1788.

59 *Id.* at 1774.

60 *See, e.g.*, *In re* Ins. Brokerage Antitrust Litig., 297 F.R.D. 136, 151-52 (D.N.J. 2013) (approving the use of postcard notice where the notice indicated that more detailed information would be sent upon request).

in cases where the defendant regularly mailed such statements and the class consisted of current customers.[61]

Notwithstanding the continued prominence of mail notice, it is an imperfect means of informing class members of important rights. First, standard mail notice programs can be expensive. For example, one court recently directed the parties in a class action to mail individual notice to a staggering thirteen million known class members to satisfy the requirements of Rule 23 and procedural due process.[62] At the current postage rate of forty-nine cents, the cost of this notice program would exceed six million dollars. It is reasonable to surmise that, in instances such as this, the potential expense of providing individual notice may deter low-value class actions from being brought in the first place.

Second, mailing lists are not always accurate because individuals move and change addresses.[63] As discussed, the easiest way for parties to update a class mailing list is to review the NCOA Database. However, the database only displays changes in addresses for up to four years.[64] If a class member changed addresses outside of that four-year window, the database will not reflect a new address. A party or notice expert may then be unable to find a new address and, as a result, the class member may not receive notice. More telling, studies estimate that over forty percent of individuals fail to report changes of address to the Post Office altogether, meaning the NCOA database will not show an updated address for a large number of individuals.[65] As a result of the four-year window and the frequent failure of individuals to report changes in address, parties may sometimes be able to find correct addresses for only half of the total potential class.[66]

Third, even if the parties have or can locate a class member's proper address, studies show that individuals do not read all the mail they receive.[67] Notice by mail may *reach* a class member, but there is no guarantee that he or she will read it, and there is no means to verify this. Thus, although courts

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61 *See, e.g.*, *In re* AT & T Mobility Wireless Data Servs. Sales Tax Litig., 789 F. Supp. 2d 935, 968 (N.D. Ill. 2011) (approving a notice plan that would mail 22.5 million notices to AT & T customers as part of their monthly bill); Schulte v. Fifth Third Bank, 805 F. Supp. 2d 560, 596 n.24 (N.D. Ill. 2011) (approving a notice plan where individual notice would be included in the monthly statements mailed to the defendant bank's customers).

62 *In re* Checking Account Overdraft Litig., 830 F. Supp. 2d 1330, 1342 (S.D. Fla. 2011).

63 *See* Hilsee, *supra* note 8, at 1789 (stating that databases containing class member information may not be up to date because individuals may not report changes of address every time they move).

64 *Id*.

65 *Id*.

66 *See* Robert H. Klonoff et al., *Making Class Actions Work: The Untapped Potential of the Internet*, 69 U. PITT. L. REV. 727, 731 (2008) [hereinafter Klonoff et al., *Making Class Actions Work*] ("In some class action lawsuits, current correct addresses may be found for only 50% of identifiable class members.").

67 *See* Hilsee, *supra* note 8, at 1794 (citing various studies that indicate individuals do not read the majority of the mail they receive, including one study that found "75% of all direct mail ends up in the trash unopened").

have long used standard mail to provide individual notice, it is not a perfect means of informing class members of their rights.

It is somewhat perplexing then, in light of the problems associated with mail notice and dramatic advances in communications technologies in recent decades, that courts and parties regularly rely on standard mail notice. Courts rarely discuss the reason for such reliance, but the answer is likely quite simple: standard mail has long been the preferred means of providing individual notice. Consequently, both precedent—including the Supreme Court's explicit approval of mail notice in *Mullane* and *Eisen*—and tradition influence courts to continue approving mail notice today.[68] Courts can and do approve mail notice programs with little analysis by simply citing extensive and longstanding precedent. They may also be wary of employing new forms of individual notice, like email, that have not been tried and tested (or received Supreme Court approval) to the same extent as mail notice.[69]

Unfortunately, by relying on mail notice with little scrutiny or analysis, courts may fail to fully appreciate its limitations. Such notice may be ineffective when, for instance, the class is comprised of members likely to move frequently, such as college students, or when a large percentage of the class has recently had to relocate, such as in class actions arising from natural disasters. As discussed below, situations exist where mail notice is appropriate, but it is imperative that courts and parties fully consider its implications. It is also important that they consider supplementing mail notice, or using an alternative form of individual notice, such as email, when appropriate. Otherwise, courts and parties may fail to provide the best notice practicable.

B. *Publication Notice*

In addition to mail notice, courts have traditionally permitted parties to use newspapers to disseminate notice to class members.[70] They have primarily done so in two situations. First, courts and parties have used, and continue to use, notice in newspapers to supplement individual notice where the names

68 *See, e.g.*, Harlan v. Transworld Sys., Inc., 302 F.R.D. 319, 331 (E.D. Pa. 2014) (citing *Mullane* and *Eisen* in holding that notice through standard mail satisfied the requirements of Rule 23 and due process).

69 *See, e.g.*, Karvaly v. eBay, Inc., 245 F.R.D. 71, 91 (E.D.N.Y. 2007) ("[W]hile noting that there are remarkably few cases addressing this issue, the Court is not persuaded that notice to Eligible Class Members by electronic mail, though clearly more convenient and less expensive for the parties, is an adequate substitute for the traditional method of notifying prospective class members by first-class mail.").

70 *See* Jordan S. Ginsberg, Comment, *Class Action Notice: The Internet's Time Has Come*, 2003 U. CHI. LEGAL F. 739, 740 ("[W]here parties cannot identify parties sufficiently to effectuate personal mailing of notices, courts regard publication notice as the next best thing.").

and addresses of certain class members are unknown.[71] Second, courts have used notice in newspapers to provide constructive notice where the identities of individual class members are not reasonably ascertainable.[72] Notice of this type often appears in national periodicals, such as *The New York Times* or *The Wall Street Journal*,[73] in one-eighth page advertisements.[74]

Courts similarly allow the use of magazines to supplement individual notice or to provide constructive notice where individual notice is not possible.[75] Parties generally use magazines of general circulation when trying to appeal to a broad, diverse class. For instance, in a class action involving overdraft charges, which implicated the rights of a large number of people, one court approved a notice plan proposing to place notice in *People*, *Sports Illustrated*, and *TV Guide*.[76] In contrast, parties use special interest magazines when trying to appeal to a class whose members share a particular interest. For example, in a class action on behalf of teachers, one court approved a notice plan seeking to publish notice in the *Chronicle of Higher Education* because of its distinct appeal to that specific class.[77]

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71 *See, e.g.*, *In re* Flonase Antitrust Litig., 291 F.R.D. 93, 99 (E.D. Pa. 2013) (approving a notice plan supplementing postcard notice with publication notice in newspapers to reach former Flonase users); Bauer-Ramazani v. Teachers Ins. & Annuity Ass'n of Am.-Coll. Ret. & Equities Fund, 290 F.R.D. 452, 464 (D. Vt. 2013) (approving a notice plan using publication notice in *The New York Times* and *The Wall Street Journal* to supplement mail and email notice where a number of potential class members were unknown); Turner v. Murphy Oil USA, Inc., 472 F. Supp. 2d 830, 840-42 (E.D. La. 2007) (approving a notice plan that supplemented direct mail notice with publication notice in local and national papers in an attempt to reach individuals whose losses forced them to vacate their homes after an oil spill caused by Hurricane Katrina); *In re* Glob. Crossing Sec. & ERISA Litig., 225 F.R.D. 436, 446-47 (S.D.N.Y. 2004) (approving a notice plan that included publication notice in *The New York Times*, *The Wall Street Journal*, *USA Today*, and sixteen regional newspapers where potential securities and ERISA class members were unknown).

72 *See, e.g.*, Hughes v. Kore of Ind. Enter., 731 F.3d 672, 677 (7th Cir. 2013) (finding publication in local newspapers to be the best notice practicable because of the difficulty in identifying members of a class comprised of persons who had used two ATM machines); *In re* Motor Fuel Temperature Sales Practices Litig., 279 F.R.D. 598, 617-18 (D. Kan. 2012) (approving publication notice in a number of newspapers where individual members of the class—comprised of current state residents who had purchased motor fuel from a particular gas station—could not be identified).

73 *See Bauer-Ramazani*, 290 F.R.D. at 464 (requiring that notice be placed in either *The New York Times* or *The Wall Street Journal*); *In re Glob. Crossing Sec. & ERISA Litig.*, 225 F.R.D at 446-47 (reviewing a notice plan including publication in *The New York Times*, *The Wall Street Journal*, and *USA Today*).

74 *See* Ginsberg, *supra* note 70, at 750 (discussing typical notice practices in national periodicals).

75 *See, e.g.*, *In re* CertainTeed Corp. Roofing Shingle Prods. Liab. Litig., 269 F.R.D. 468, 481-82 (E.D. Pa. 2010) (approving a notice plan including publication in magazines to supplement direct mailings).

76 *See In re* Checking Account Overdraft Litig., 830 F. Supp. 2d 1330, 1342 (S.D. Fla. 2011) (allowing for the publication of notice in mainstream publications to reach a class of over thirteen million); *see also In re* Imprelis Herbicide Mktg. Sales Practices & Prods. Liab. Litig., 296 F.R.D. 351, 363 n.5 (E.D. Pa. 2013) (approving a notice plan that would provide publication notice in *Parade*, *People*, *Better Home and Gardens*, and *Time*).

77 *Bauer-Ramazani*, 290 F.R.D. at 464.

As with mail notice, it appears that courts continue to allow parties to place notice in newspapers and magazines based on longstanding precedent and tradition.[78] *Mullane* is important here again because the Court there found publication notice to be constitutionally sufficient where individual notice was not possible.[79] Courts may thus cite *Mullane*, as well as other cases, when approving notice plans dependent on publication notice without engaging in critical analysis of whether such notice is the best practicable. But doing so sidesteps significant problems with publication notice. One such problem is decreasing readership. In 2003, the three largest American newspapers—*The New York Times*, *The Wall Street Journal*, and *USA Today*—had an average daily readership of more than 11 million people.[80] In ten years time that number had decreased to approximately 3 million daily readers—a loss of over 7 million daily readers (or about 760,000 daily readers per year).[81] Of particular concern for the future of the industry, only twenty-three percent of individuals ages eighteen to thirty-four reported having read a daily newspaper the previous day.[82] It thus stands to reason that as older generations pass away, the readership base of newspapers will only continue to shrink. A similar problem exists in the magazine industry. One well-known example is *Newsweek*, which briefly ceased its print publication in 2012 in part because its readership had decreased by half since 2005.[83]

A further problem with publication notice is that newspaper and magazine readers tend not to be representative of the general population. Print newspaper readers tend to be high income, college educated, non-minority individuals who are sixty-five or older.[84] As an example from the magazine industry, the median age of *Time Magazine* readers in the United States is fifty, their median household

78 *See, e.g.*, Mirfasihi v. Fleet Mortg. Corp., 356 F.3d 781, 786 (7th Cir. 2004) (citing cases for the proposition that, "[w]hen individual notice is infeasible, notice by publication in a newspaper of national circulation . . . is an acceptable substitute").

79 *See supra* text accompanying note 43.

80 *See* Ginsberg, *supra* note 70, at 752-53 (discussing readership sizes of leading periodicals).

81 Rick Edmonds et al., *Newspapers: By the Numbers*, ST. OF THE NEWS MEDIA (May 7, 2013), http://www.stateofthemedia.org/2013/newspapers-stabilizing-but-still-threatened/newspapers-by-the-numbers [https://perma.cc/XK32-XCWG].

82 *Id*.

83 *See* Robert Daniel & Keach Hagey, *Turning a Page:* Newsweek *Ends Print Run*, WALL ST. J. (Dec. 26, 2012), http://www.wsj.com/articles/SB10001424127887324660404578201432812202750 [https://perma.cc/HWE9-4HNR] (discussing the demise of *Newsweek*). *Newsweek* has returned to print, but at a much lower volume. *See* Leslie Kaufman, *Tiny Digital Publisher to Put* Newsweek *Back in Print*, N.Y. TIMES (Mar. 2, 2014), http://www.nytimes.com/2014/03/03/business/media/tiny-digital-publisher-to-put-newsweek-back-in-print.html?_r=0 [https://perma.cc/K86B-8MTW] ("*Newsweek*'s print ambitions are modest. It plans to print 70,000 copies—at its peak two decades ago, circulation was 3.3 million—and sell them for $7.99 each, with the magazine's content also available online for a more affordable price.").

84 For the precise statistics, see Edmonds et al., *supra* note 81.

income is $74,981, and 73% attended graduate school.[85] Comparatively, the median age of U.S. residents is 37.4, their median household income is $53,482, and only eleven percent of residents have a graduate or professional degree.[86] Publishing notice in a newspaper or magazine is thus unlikely to provide actual notice in class actions vindicating the rights of those who are not members of these niche readerships, including young or working-class individuals.

Perhaps most importantly, publication notice rests on "the legal fiction that publication in newspapers [or magazines] which class members are somewhat more likely to read is sufficient to put class members on notice of the pending action and their rights."[87] That is, it rests on the hope that class members will stumble across an advertisement in a newspaper or magazine on the particular day or in the issue in which it is available and will be alerted to the fact that they are part of an ongoing class action. Courts have long recognized the problems inherent in this fiction,[88] but as readership shrinks, that legal fiction diverges further from reality.

In light of these shortcomings, courts and parties need to be increasingly critical of publication notice, especially when it is the primary means by which notice is disseminated. Courts cannot simply continue to rely on tradition and existing precedent, but rather must assess whether publication notice is likely to apprise class members of their rights in a given case. And both courts and parties need to consider alternatives that serve the same ends, such as the various forms of electronic notice discussed below.

C. *Television and Radio*

Courts have also sometimes permitted the use of television advertisements to supplement individual notice plans, or as part of constructive notice campaigns,[89] and they continue to do so today.[90] Although television notice has

85 *Media Kit*, TIME, http://www.timemediakit.com/audience [https://perma.cc/JW3G-AJXV] (last updated Dec. 5, 2016).

86 *Population and Housing Narrative Profile 2010–2014 American Community Survey 5-Year Estimates*, U.S. CENSUS BUREAU, http://thedataweb.rm.census.gov/TheDataWeb_HotReport2/profile/2014/5yr/npo1.hrml?SUMLEV=10 [https://perma.cc/H78H-SGC5].

87 *See* Walters, *supra* note 54, at 8; *see also* Lauren A. Rieders, Note, *Old Principles, New Technology, and the Future of Notice in Newspapers*, 38 HOFSTRA L. REV. 1009, 1025 (2010) (submitting that *Mullane* stands for the proposition that "newspaper notice should only be used as a last resort").

88 *See, e.g.*, Hughes v. Kore of Ind. Enter., 731 F.3d 672, 677 (7th Cir. 2013) ("We are mindful that notice by publication involves a risk that a class member will fail to receive the notice and as a result lose his right to opt out of the class action—a right that can be valuable if his individual claim is sizable.").

89 *See* Ginsberg, *supra* note 70, at 749-50 ("By the late 1960s, television became a significant part of numerous adequate notice schemes.").

90 *See, e.g.*, *In re* Imprelis Herbicide Mktg. Sales Practices & Prods. Liab. Litig., 296 F.R.D 351, 363 (E.D. Pa. 2013) (approving a notice plan that included a television advertisement to be aired in forty-six markets); *In re* CertainTeed Corp. Roofing Shingle Prods. Liab. Litig., 269 F.R.D. 468, 481-82 (E.D. Pa. 2010) (approving a notice plan that included the use of television advertisements).

the potential benefit of reaching a large number of people, it comes with an "exorbitant price tag" that has long limited its usefulness and practicality.[91] It is simply cheaper to use newspapers to achieve similar ends. In addition, changes in technology are reducing television viewership, further undermining the usefulness of this medium.[92] Consumers are turning to online streaming services and using digital video recorders (DVRs) to watch their favorite shows,[93] such that notice disseminated through commercials will not reach them. In short, courts and parties have seldom relied on television advertisements to disseminate notice—a trend that seems unlikely to change in the future.

Finally, courts have allowed and continue to allow parties to use radio advertisements to supplement individual notice or as part of a constructive notice program. For instance, one court recently approved a notice plan seeking to place radio advertisements on thirty-nine radio stations as part of a larger supplemental notice program.[94] With more people turning to online radio,[95] however, the reach of traditional radio is decreasing. Like newspapers, magazines, and television, it is quickly becoming a technology of the past, ill-suited to disseminate notice in the modern world.

D. *A Changing World for Traditional Media*

The traditional means by which courts and parties have provided class action notice—direct mail notice, publication notice in newspapers and magazines, and notice over television and radio—are still relevant in certain situations. For example, direct mail notice is still appropriate in small class actions where there are lists identifying all potential class members.[96] It is also appropriate in cases where email is not, as in class actions consisting of persons unlikely to use the internet (for instance, the elderly[97]), or situations in which a large number of emails proved undeliverable.[98] Similarly,

91 Klonoff et al., *Making Class Actions Work*, *supra* note 66, at 732.

92 *See id.* at 732-33 (noting that new technology is reducing television viewership, particularly among internet users).

93 *Id.*

94 *In re* Motor Fuel Temperature Sales Practices Litig., 279 F.R.D. 598, 618 (D. Kan. 2012).

95 *See* Laura Houston Santhanam et al., *Audio: How Far Will Digital Go?*, ST. NEWS MEDIA (2012), http://www.stateofthemedia.org/2012/audio-how-far-will-digital-go [https://perma.cc/MA86-G4WB] (reporting that internet radio use increased by four percent among Americans age twelve and over between 2010 and 2011).

96 *See, e.g.*, Ogbuehi v. Comcast, Inc., 303 F.R.D. 337, 355 (E.D. Cal. 2014) (approving a notice plan using first class mail to send notice to the members of a small class).

97 *See infra* text accompanying note 171.

98 *See infra* note 134 and accompanying text.

publication notice is appropriate where the class is comprised of members less likely to use modern communication technologies.[99]

Nonetheless, the usefulness of traditional media is decreasing with time, due in no small part to the exponential growth of new technologies. People can now communicate over text or email rather than through standard mail, turn to the internet for news, and stream videos and music online. It is therefore unsurprising that some courts are beginning to recognize the important role that electronic communication can play in providing the best notice practicable to a given class. As Judge Posner prophetically observed over a decade ago, "[I]n this age of electronic communications, newspaper notice alone is not always an adequate alternative to individual notice . . . . The World Wide Web is an increasingly important method of communication, and, of particular pertinence here, an increasingly important substitute for newspapers."[100] I turn now to modern forms of notice.

III. THE IMPACT OF MODERN TECHNOLOGY ON CLASS ACTION NOTICE

In recent years, courts have begun to approve notice plans employing modern technologies with increasing frequency. As recounted below, they have permitted email notice in lieu of mail notice, especially in actions involving large internet companies or small settlements.[101] They have also permitted parties to use the internet to provide supplemental or constructive notice, relying on tools like banner and pop-up advertisements,[102] keyword search results,[103] and dedicated websites.[104]

It is important for courts and parties to continue to use these electronic means of communication because of their popularity, accessibility, and low cost.[105] At the very least, modern means of communication should complement traditional means of providing notice. More ambitiously, courts and parties should, in appropriate circumstances, consider replacing traditional forms of

99 *See infra* text accompanying note 171.

100 Mirfasihi v. Fleet Mortg. Corp., 356 F.3d 781, 786 (7th Cir. 2004).

101 *See infra* Section III.A.

102 *See infra* subsection III.B.1.

103 *See infra* subsection III.B.2.

104 *See infra* subsection III.B.4.

105 Other commentators have similarly called for courts and parties to expand their use of electronic communications. *See, e.g.*, Klonoff et al., *Making Class Actions Work*, *supra* note 66, at 751 ("Accordingly, courts ought to rely more on the internet as a cost-effective and capable tool for delivering notices. Indeed, the internet should lead courts to expand and rethink their notice guidelines. When the rules and decisions governing notice were implemented, the internet did not exist. This new technology should alter and replace the old rules of class action notices.").

notice with more modern forms or reposition modern forms of notice to serve as the focal point in plans employing both traditional and modern means.

A. *Individual Notice Via Email*

In light of the explosion in personal email use,[106] a number of courts have approved notice plans seeking to send individual notice to class members via email instead of standard mail. One court, for instance, approved a notice plan proposing to send email notice to roughly thirteen million class members.[107] Another court approved a notice plan proposing to send email notice to the email addresses that customers provided to the defendant when registering products for a warranty.[108] Still another court went so far as to require the parties to send notice by email, rather than by standard mail, unless the defendant bore the costs of mail notice, including additional postage.[109] Finally, one court approved an email notice program, lauding it as "extensive, multifaceted, and innovative."[110] That court found email to be particularly appropriate because the class's "allegations [arose] from their visits to Defendants' Internet websites, demonstrating that the Settlement Class Members [were] familiar and comfortable with email and the internet."[111] The court also complimented the "clear and concise form" of the emails, which would "reduce the chances of the emails being blocked by spam filters."[112] In the event the email was bounced back, the court directed that notice be sent by standard mail.[113]

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106 It is estimated that roughly eighty-eight percent of adults have a personal email account. Kevin W. Lewis, Comment, *E-Service: Ensuring the Integrity of International E-Mail Service of Process*, 13 ROGER WILLIAMS U. L. REV. 285, 300-01 (2008).

107 *In re* HP Inkjet Printer Litig., No. 5:05-cv-3580, 2011 WL 115863, at *3 (N.D. Cal. Mar. 29, 2011), *rev'd on other grounds*, 716 F.3d 1173 (9th Cir. 2013).

108 *See In re* Pool Prods. Distribution Mkt. Antitrust Litig., 310 F.R.D. 300, 318 (E.D. La. 2015) (noting that "databases revealed the names and email addresses of over 250,000 people or entities").

109 *See* Bauer-Ramazani v. Teachers Ins. & Annuity Ass'n of Am.-Coll. Ret. & Equities Fund, 290 F.R.D. 452, 464 (D. Vt. 2013) (noting that the defendants would also have to display the amended class definition on their website and print notice in either *The New York Times* or *The Wall Street Journal*).

110 Browning v. Yahoo!, Inc., No. C0401463, 2006 WL 3826714, at *8 (N.D. Cal. Dec. 27, 2006).

111 *Id.*

112 *Id.*

113 *Id.*; *see also* Hanlon v. Palace Entm't Holdings, LLC, No. 11-987, 2012 WL 27461, at *6 (W.D. Pa. Jan. 3, 2012) (finding that both publication and email notice satisfied Rule 23 and due process requirements where the email list contained those persons most likely to be members of the class); Kelly v. Phiten USA, Inc., 277 F.R.D. 564, 569-70 (S.D. Iowa 2011) (approving a notice plan that provided direct notice to the roughly 115,000 known class members through email). As they have done with standard mail, courts have also approved notice plans seeking to disseminate notice via email using a class member's electronic monthly billing statement. *See, e.g.*, Hall v. AT&T Mobility LLC, No. 07-5325, 2010 WL 4053547, at *4-6 (D.N.J. Oct. 13, 2010).

Courts have tended to be the most receptive to email notice in class actions involving internet companies. For example, in a recent class action against LinkedIn, the court approved a notice plan relying exclusively on email to disseminate individual notice.[114] Courts seem willing to embrace email notice in these cases for two reasons. First, it is relatively simple to send notice over email in such circumstances because the defendant company will typically have a list of class members' email adresses,[115] obviating the cost and effort otherwise associated with compiling this information. Second, the fact that the class's allegations arose from interactions with an internet company tends to show the class is at least marginally comfortable with modern technologies, including email, and thus capable of understanding and navigating notice sent through electronic means.[116]

Courts have also been receptive to email notice where the class is large and the settlement small in order to save costs. For instance, one court approved a notice plan relying on email notice in an action against Facebook because of the need to inform the class members, 125 million Facebook users, of a settlement of only $20 million.[117]

Still, not all courts have embraced email as a reasonable substitute for standard mail; some have instead adhered to tradition. One court rejected a class's proposal to send email notice (in addition to direct mail notice) to the class, comprised of the defendant's customers, along with their monthly electronic billing statement.[118] It did so because the defendant did not have a system in place to send mass emails.[119] The court also worried that the defendant would have to expend a prohibitive amount of time and resources identifying class members who used e-billing and crafting an email, as the company did not conduct such tasks "in the course of its ordinary business."[120]

Another court rejected a notice plan proposing to send notice to class members at their PayPal email addresses because it was "not persuaded that notice to eligible class members by electronic mail, though clearly more convenient and less expensive for the parties, is an adequate substitute for the traditional

114 *In re* LinkedIn User Privacy Litig., 309 F.R.D. 573, 586 (N.D. Cal. 2015).

115 *See, e.g.*, Noll v. eBay, Inc., 309 F.R.D. 593, 601 (N.D. Cal. 2015) (approving a notice plan desiring to disseminate notice to class members using email addresses possessed by eBay).

116 *See supra* text accompanying note 111.

117 *See* Kashmir Hill, *Yes, That Legal Notice You Got From Facebook Is Real*, FORBES (Jan. 26, 2013, 8:19 PM), http://www.forbes.com/sites/kashmirhill/2013/01/26/yes-that-legal-notice-you-got-from-facebook-is-real/#5d25dff81b2c [https://perma.cc/XJ92-EZTB] (discussing the Facebook class action settlement, which only offered class members up to ten dollars). Incidentally, this class action was also against a large internet-based company.

118 Minter v. Wells Fargo Bank, 283 F.R.D. 268, 274 (D. Md. 2012).

119 *Id.*

120 *Id.*

method of notifying prospective class members by first-class mail."[121] The court expressed concern that emails can be forwarded to a large number of nonclass members or posted online.[122] It also noted that eBay and PayPal are frequent targets of "unscrupulous email spoofing schemes," making it less likely that class members would treat emails containing notice seriously.[123] Finally, the court was concerned that notice would be sent to the user's PayPal email address instead of their personal email, which would prevent class members from receiving the notice unless they "actively use[d] their PayPal accounts or regularly check[ed] incoming messages on that account."[124]

Still another court rejected a plan proposing to use email notice to supplement mail notice for three reasons.[125] First, "electronic communication inherently has the potential to be copied and forwarded to other people via the internet with commentary that could distort the notice approved by the [c]ourt."[126] Second, the notice could be "reproduced to large numbers of people who could compromise the integrity of the notice process."[127] Third, "email messages could be forwarded to nonclass members and posted to internet sites with great ease."[128]

As these examples highlight, although a number of courts have embraced the important role that email can play in disseminating notice, many courts remain hesitant. But email can, and often should, replace standard mail as the preferred means of providing individual notice. At the very least, email should be used in conjunction with such traditional methods.[129] Individuals are using

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121 Karvaly v. eBay, Inc., 245 F.R.D. 71, 91 (E.D.N.Y 2007).

122 *Id.*

123 *Id.*

124 *Id.* at 92.

125 Reab v. Elec. Arts, 214 F.R.D. 623, 630-31 (D. Colo. 2002).

126 *Id.*

127 *Id.* at 631.

128 *Id.*

129 It should be noted here that email notice is a constitutionally adequate means of disseminating notice. An email is a textual document that one person affirmatively sends to another, email is a highly popular means of communication in the modern world, and email is reliable and secure. *See* Rachel Cantor, Comment, *Internet Service of Process: A Constitutionally Adequate Alternative?*, 66 U. CHI. L. REV. 943, 964-66 (1999) (arguing that notice via email is constitutionally adequate because of its widespread use, reliability, and security); Jennifer Mingus, Comment, *E-Mail: A Constitutional (and Economical) Method of Transmitting Class Action Notice*, 47 CLEV. ST. L. REV. 87, 97-98 (1999) (arguing that email satisfies the individual notice requirement of *Eisen* because it is a means of communication affirmatively directed at a potential class member). Hence, "it will frequently be a method of [notice] reasonably calculated to reach a [class member] and . . . result in actual notice." Cantor, *supra*, at 964. In these respects, email is quite similar to standard mail, and, as with standard mail, courts should have no problem finding that it satisfies due process considerations. Of course, this is not to suggest that email is *always* the "best notice that is practicable under the circumstances." FED. R. CIV. P. 23(c)(2)(B). A court must consider alternatives in every case. Rather, it is meant to suggest that email can satisfy

email more frequently and using standard mail less frequently.[130] Importantly, many consumers prefer to receive commercial communications via email.[131] If the goal of notice is to actually inform class members of their rights, email may be a better means given its popularity.

Another reason to use email to provide notice is that methods for updating the addresses of people who have moved often prove ineffective.[132] It is thus difficult to reach these individuals using standard mail. By contrast, individuals can keep the same email address when they move, allowing email notice to reach them where mail notice could not. Although it is true that individuals periodically change their email addresses,[133] any concern that varying email addresses will render notice undeliverable and ineffectual is mitigated by the fact that email allows a sender to use "read receipts," which send a response message to the sender when an email is opened.[134] A party sending email notice is thus able not only to determine how many people actually viewed the notice, but also to supplement the notice by sending another email or using another form of notice if the sender does not receive a read receipt. If a large number of emails go unopened, possibly indicating an outdated contacts list, read receipts can indicate to a court that the parties need to use other means to effectuate notice. Because traditional mail lacks a comparable mechanism to determine whether the mail was opened, email may be a preferable means of providing notice in today's fluid world.

Furthermore, whereas traditional mail imposes the costs of paper, postage, and packing, email is generally free with an internet subscription.[135] These savings may prove salient in class actions involving low payouts, given that expensive notice programs may diminish the available recovery for class members or deter class actions altogether.

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the requirements of procedural due process such that constitutional considerations do not impose a per se bar on the use of email notice.

130 *See* Cantor, *supra* note 129, at 964 ("Electronic mail has significantly reduced the amount of mail delivered each year by the United States Postal Service, demonstrating a trend toward electronic communication and away from traditional paper-based forms of communication.").

131 *See* LORI CONNOLLY, MERKLE, VIEW FROM THE DIGITAL INBOX 2011: DIGITAL MARKETING INSIGHTS FROM THE ANNUAL CONSUMER ATTITUDES AND USAGE STUDY 9 (2011), http://www.merkleinc.com/sites/default/files/whitepapers/WP-DigitalInbox_11Jul_0.pdf [https://perma.cc/9N4J-6233] (reporting that adults prefer email "over direct mail nearly five to one" for commercial communications).

132 *See* Klonoff et al., *Making Class Actions Work*, *supra* note 66, at 731 (noting that correct addresses in some class actions can be found for only fifty percent of identifiable class members).

133 *See, e.g.*, Jay Baer, *15 Email Statistics That Are Shaping the Future*, CONVINCE & CONVERT, http://www.convinceandconvert.com/convince-covert/15-email-statistics-that-are-shaping-the-future [https://perma.cc/J4W4-425A] (stating thirty percent of subscribers "change email addresses annually").

134 *See* Klonoff et al., *Making Class Actions Work*, *supra* note 66, at 751 n.171 (explaining that read receipts allow emails to be returned to the sender when an intended recipient opens the email).

135 *See* Mingus, *supra* note 129, at 110-11 ("Notice by e-mail [does] not involve the costs of paper, printing, and postage incurred from notice by traditional mail. The only costs for e-mail notice [are] the monthly online service fee . . . and any labor needed to compile the class list and type in the e-mail addresses.").

Finally, the concerns that courts and commentators have raised about email notice are not sufficiently persuasive to undermine its usefulness. One concern is that individuals can share email notice beyond the class by forwarding it to other people, distorting the approved notice.[136] However, publication notice can also reach nonclass members as it is available to the public at large. Considering that courts have not limited the use of publication notice based on this concern, the same should hold true for notice sent via email. More to the point, experience with email notice demonstrates that this concern is overblown. To the author's knowledge, there have been no instances in which email notice was distorted in a manner that undermined the effectiveness of the court-approved notice program.

Another concern is that automated spam filters may block email notice, thereby preventing such notice from reaching intended class members. But this does not mean that courts and parties should avoid email notice altogether. Rather, it places the onus on the party providing notice to ensure that the email is not flagged as spam, which can be accomplished with relative ease.[137] Moreover, courts and parties can mitigate this concern by providing supplemental notice through other mediums, such as internet advertising. They can also use read receipts to determine whether recipients opened the email, which, in turn, can provide some indication of whether they were blocked as spam. If a significant number of emails went undelivered, a court could direct a party to craft a new email or to use other means to effectuate notice.

An additional concern with email notice is that not everyone has email or internet access, making electronic notice to them impossible. However, there are similar concerns with standard mail: because class mailing lists do not always contain accurate addresses, and current addresses may not be obtainable, notice may be undeliverable to some class members through the mail, even if those class members have a physical address.[138] Nonetheless, courts still allow parties to use mail notice. Even if some class members cannot be reached via email, consistency militates against foregoing email notice on that basis alone. Furthermore, recognizing that mail notice will not reach every class member, courts have required parties to use supplemental notice—an equally feasible option in the email context.

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136 *See* Reab v. Elec., 214 F.R.D. 623, 630 (D. Colo. 2002) (expressing concern that "electronic communication inherently has the potential to be copied and forwarded to other people via the internet with commentary that could distort the notice approved by the [c]ourt").

137 For a discussion of easy steps to craft an email that will not be blocked by a spam filter, see *PB Tip: How to Prevent Your Emails From Getting Treated Like Spam*, PROGRESSIVE TECH. PROJECT, http://www.progressivetech.org/powerbase/pb-tip-how-to-prevent-your-emails-from-getting-treated-like-spam [https://perma.cc/KWV6-AHRW].

138 *See supra* note 133 and accompanying text.

In sum, although email is not perfect, concerns about its use do not outweigh its benefits with respect to popularity, usability, and cost. At the very least, courts and parties should consider using email in addition to standard mail, thereby increasing the number of avenues through which notice might reach a class member. More ambitiously, in a number of instances, email can replace standard mail as the means by which courts and parties send individual notice. This is particularly true in class actions involving small claims or against large internet companies. Courts and parties should not continue using standard mail based on longstanding precedent alone. Instead, they should consider email as a viable alternative to mail and use it with greater regularity.

B. *Supplemental and Constructive Notice over the Internet*

Just as courts have begun permitting parties to use email to send individual notice to class members, they have also begun permitting parties to use various online tools to either supplement individual notice or to provide constructive notice. These include banner and pop-up advertisements on third-party websites, keyword search results, posting notice to the defendant company's website, and creating websites dedicated to the particular class action suit. I discuss each tool in turn, detailing some of its unique advantages, before turning to a general analysis of the benefits and limitations of the internet as a means of providing supplemental and constructive notice.

1. Banner and Pop-Up Advertisements

Courts have allowed parties to post notice online in banner or pop-up advertisements on third-party websites to provide notice to unknown class members.[139] As their names suggest, banner advertisements display notice in a banner at the top of a webpage[140] while pop-up advertisements appear dynamically on the webpage.[141]

In actions with a large and diverse class, parties tend to display advertisements on popular sites such as Google. In actions with smaller or more specific classes, parties make use of niche sites targeted to a particular readership. As an example of the former, the court overseeing litigation connected with the Deepwater Horizon oil spill approved a notice plan proposing, in part, to post notice on popular internet sites, including Google, likely due to the large number of

139 *See, e.g.*, *In re* Briscoe, 448 F.3d 201, 207 (3d Cir. 2006) (affirming the trial court's decision to use a notice plan that included "banner advertisements on the Internet directing class members to the official settlement website").

140 *See Banner Ad*, THE NEW OXFORD AMERICAN DICTIONARY 128 (Erin McKean ed., 2d ed. 2005) (defining a banner advertisement as "an advertisement appearing across the top of a web page").

141 *See Pop-up*, WEBSTER'S NEW WORLD COLLEGE DICTIONARY (5th ed. 2014) (defining pop-up as "a window . . . that appears superimposed over the window in use").

individuals affected.[142] As an example of the latter, a notice plan in a diet drug suit "consisted of placing a summary advertisement and link to the settlement website on the top 25 online magazines and websites where diet supplements similar to defendant's were referenced and discussed."[143] Advertisements also appeared "on over 1,600 websites where potential class members were discussing the product, selling the product or similar products, or linking to websites selling these products during the class period."[144] The choice between general interest sites and niche sites appears to turn on the nature and characteristics of the class. Predictably, where the class is large and features a diverse group of people, courts and parties prefer sites with a broader reach. Where the class can be more narrowly defined based on particular interests or characteristics, courts and parties attempt to use targeted websites. While these insights are perhaps intuitive, it is important to make them explicit given the dearth of explanation in court orders approving notice plans.

Relative to traditional means of supplemental or constructive notice, targeted banner and pop-up advertisements offer a better means of reaching large classes of people who share certain characteristics but who are difficult to identify individually.[145] Internet users freely provide vast amounts of information about themselves to the websites they visit, allowing companies to track their habits and determine their preferences and interests.[146] Companies are then able to use that information to determine how and where to reach consumers.[147] For example, Facebook collects extensive data about users, including what pages a user has "liked."[148] It also purchases data from outside companies to increase the diversity and breadth of its information.[149]

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142 *In re* Oil Spill by Oil Rig Deepwater Horizon in Gulf of Mex., 910 F. Supp. 2d 891, 939-40 (E.D. La. 2012) [hereinafter *Deepwater Horizon*].

143 Julie Locke, *Tips for Using New Media in Class Action Notice Plans*, LAW360 (Jan. 19, 2011, 2:18 PM), http://www.law360.com/articles/218356/tips-for-using-new-media-in-class-action-notice-plans [https://perma.cc/T92K-T4K5].

144 *Id.*

145 *See* Walters, *supra* note 54, at 9 (explaining that the internet allows parties to provide notice that is narrowly tailored to their intended audience).

146 *See id.* at 9-10 ("[M]any individuals freely provide personal information to websites, including their names, addresses, ages, occupations, and interests.").

147 *See id.* at 10 ("Taking into account the probable interests and characteristics of class members, plaintiffs could purchase interactive advertising space that would appear when individuals with the particular interests or characteristics are using the Internet.").

148 *See* Joshua A.T. Fairfield & Erik Luna, *Digital Innocence*, 99 CORNELL L. REV. 981, 999-1000 (2014) (discussing Facebook's growing data collection capabilities); *see also* Albergotti, *supra* note 4 (noting that Facebook collects data on user "likes").

149 *See* Somini Sengupta, *What You Didn't Post, Facebook May Still Know*, N.Y. TIMES (Mar. 25, 2013), http://nyti.ms/1Ol2i8C [https://perma.cc/5HGV-5JJN] (discussing Facebook's partnerships with "four companies that collect lucrative behavioral data, from store loyalty card transactions and

Facebook then uses this data, in conjunction with proprietary algorithms, to better understand individual consumers and target advertisements based on identifiable patterns in the data reflecting likely interests.[150] Facebook can, for instance, target those who have expressed some sort of interest in bowling with ads related to bowling.[151]

By advertising with these internet companies, parties in the class action context can benefit from their data and proprietary analytics. Parties can communicate to the company the likely characteristics or interests of class members and pay for advertising space; the company can, in turn, use its data and algorithms to target advertisements to those persons thought to have the particular characteristics or interests.[152] In other words, the process allows parties to harness large amounts of information about potential class members to discern where they are likely to see notice, and post such notice accordingly. Reading a newspaper or listening to the radio does not facilitate the same flow of information because there is no two-way dialogue. As a result, it is more difficult to know whether a particular newspaper or radio program is an effective avenue to disseminate notice. Parties using traditional media must rely on generalized data and best guesses rather than the particularized real-time data that modern media offers.

2. Keyword Search Results

Courts are also approving parties' use of keyword search results to place advertisements containing notice in front of any person who has searched a term or phrase related to the class.[153] A party can now simply pay a search engine like Google to display a sponsored advertisement that links to more information near the top of search results when a person searches for certain

customer e-mail lists to divorce and Web browsing records"). The collection of this data is continuously expanding as more individuals use a variety of services that share data, including Google Maps, Facebook apps, Apple's iTunes Store, and online storage platforms like Dropbox and Google Drive. *See* Gabriel R. Schlabach, Note, *Privacy in the Cloud: The Mosaic Theory and the Stored Communications Act*, 67 STAN. L. REV. 677, 688-89 (2015).

150 *See* Schlabach, *supra* note 149, at 687 ("[T]he business strategies of many major Internet service providers, most notably Google, depend on acquiring as much information as possible about their customers from multiple sources and combining these data into centralized records, which these companies can use for a variety of purposes, including targeted advertising."); *id.* at 689 (noting that eighty-four percent of Google's 2013 revenue derived from advertising).

151 *See* Albergotti, *supra* note 4.

152 *See, e.g.*, *Facebook Advertising Targeting Options*, FACEBOOK, https://www.facebook.com/business/products/ads/ad-targeting [https://perma.cc/3LZZ-NCCG] (discussing how advertisers can use Facebook advertisements to target a specific audience).

153 *See, e.g.*, *In re* Philips/Magnavox Television Litig., No. 09-3072, 2012 WL 1677244, at *14 (D.N.J. May 14, 2012) (discussing that notice was disseminated, in part, through a "search engine marketing campaign that directed potential Class Members to the Settlement Web site").

keywords or phrases connected to the class.[154] For example, if the class consisted of consumers of a particular diet drug, a party could use Google to display a sponsored advertisement anytime a user searched certain words or phrases linked to the diet drug, such as its name. Courts and parties can measure the effectiveness of this method by reviewing how many people the advertisement appeared before each day, and how many of those people actually clicked the link and sought more information.[155]

Advertising through keyword search results is an efficient means for courts and parties to provide notice to unknown class members. It allows a person to make him or herself known by seeking information pertinent to the class, and then directs notice to that person. In so doing, keyword search results can save courts and parties the trouble of attempting to determine whether a class member is likely to read a certain newspaper, watch a particular television program, or even visit a specific website.

3. A Defendant Company's Website

Courts have also approved notice plans seeking to post notice on a defendant company's website.[156] While such opinions offer scant reasoning for doing so, the underlying logic seems clear. The overwhelming majority of companies have an online presence, and where a person thinks a company has harmed him or her in some way (for instance, in a securities or consumer class action), it is reasonable to assume that she will go to the company's website with questions.[157] If notice is available on the website, that person will see it and receive notice.[158] Moreover, it is fairly simple for a company to post notice on its website, evidenced by the fact that many companies regularly post information online in a similar manner. The associated costs and effort are low

154 *See* Locke, *supra* note 143 ("When a person types these words or phrases into a search engine such as Google or Yahoo!, the ad will appear at or near the top of the search engine home page. The ads themselves do not provide notice, but instead provide users with a link to the settlement website for notice and claim information."); *see also* Walters, *supra* note 54, at 25 (providing a hypothetical situation illustrating how a particular consumer class could be notified of a class action against a DVD manufacturer based on certain key words or phrases).

155 Locke, *supra* note 143.

156 *See, e.g.*, Schulte v. Fifth Third Bank, 805 F. Supp. 2d 560, 596 (N.D. Ill. 2011) (approving a notice plan that included posting notice on the defendant's website); Vaughn v. Am. Honda Motor Co., 627 F. Supp. 2d 738, 744 (E.D. Tex. 2007) (same); Martin v. Weiner, No. 06CV94, 2007 WL 4232791, at *2-3 (W.D.N.Y. Oct. 29, 2007) (same).

157 *See* Walters, *supra* note 54, at 11 ("Since almost every major corporation now has its own website, posting notice to absent members on such a site in a suit where the defendant is a corporation provides a more focused opportunity for actual notice than nearly any newspaper or journal can offer.").

158 *Id.*

enough that posting notice on a defendant company's website would be an easy way to supplement any notice plan.

4. Dedicated Websites

Finally, a number of courts have approved notice plans seeking to create a class action website as part of a larger constructive notice program.[159] These sites are designed to relay extensive information to class members and to answer any questions that class members may have.[160] They are a useful part of any modern class action notice program, as it is possible to place significantly more information on a website than in an envelope, email, or banner advertisement.

5. General Observations

With respect to supplemental and constructive notice, the internet offers a number of advantages over traditional means of providing such notice—including newspapers, television, and radio—which is perhaps why courts and parties are using it more frequently to achieve similar ends. First, it is relatively inexpensive. Placing advertisements online or creating a website costs less than publishing notice in national newspapers or advertising on television or radio.[161] This decreases the cost to parties bringing suit, allowing those with smaller claims to seek to vindicate their rights in court when they otherwise might not be able to do so. Lower-cost notice also allows courts and parties to disseminate notice through a larger number of channels, as they can direct money saved to providing additional and diverse forms of notice.

The internet also enjoys a larger, more diverse audience than newspapers or magazines. The Pew Research Center reports that "roughly nine-in-ten American adults use the internet."[162] And internet use is widespread across various demographics. Use is roughly equal with respect to gender, as 87% of adult men and 86% of adult women report using the internet.[163] With respect to age, use is also relatively equal among persons under 65, as 97% of persons aged 18 to 29, 93% of persons aged 30 to 49, and 88% of persons aged 50 to

159 *See, e.g.*, Wallace v. Powell, 301 F.R.D. 144, 159 (M.D. Pa. 2014) (approving a notice plan that included the use of "a detailed website" providing information on the class action).

160 For links to a number of these websites, see www.classaction.org [https://perma.cc/F7JK-59BK].

161 *See* Rhonda Wasserman, *Future Claimants and the Quest for Global Peace*, 64 EMORY L.J. 531, 582 (2014) ("Internet notice, including notice on Facebook, Twitter, and other social media platforms, would be relatively inexpensive. Notice by publication in national newspapers, and on television and radio, would be far more expensive . . . .").

162 *Internet/Broadband Fact Sheet*, PEW RESEARCH CTR. (Jan. 12, 2017) http://www.pewinternet.org/fact-sheet/internet-broadband [https://perma.cc/QPH3-6YCF] [hereinafter *Internet Use Fact Sheet*].

163 *Id.*

64 report using the internet.[164] The same is true with respect to education[165] and income differentials.[166] Because the internet appeals to a broad range of people, it will often prove a better means of reaching a class than newspapers or magazines, which serve a narrower market.[167]

Further, notice lasts longer when posted online, as opposed to simply running in a single edition of a print periodical.[168] This is particularly true of notice posted to a defendant-company's website and websites dedicated to a particular class action, which can remain online indefinitely, or, more practically, as long as is necessary to effectuate notice for the particular class. Increased duration, in turn, allows for more opportunities for notice to come to the attention of potential class members.

Finally, internet notice allows for greater interactivity between potential class members and class counsel, meaning a class member may be more likely to make him or herself known.[169] A potential class member does not have to fill out paperwork and mail it; instead, a person can simply fill out an online form or click a link, which provides immediate information and feedback.

The preceding discussion is not meant to suggest that internet notice is a perfect remedy to the shortcomings of constructive notice; it is not. Although it is an effective and efficient means of reaching a large, diverse audience and targeting specific groups of people, notice posted online is still not as likely to draw the attention of a potential class member and result in actual notice as an email or a piece of mail addressed specifically to the class member. Thus, internet notice cannot supplant individual notice when such notice is practical through other means. Instead, in such situations, courts should allow it to supplement individual notice. Whereas courts and parties may have previously been hesitant to provide supplemental notice in light of the higher costs associated with traditional forms of notice, the internet allows parties to supplement individual notice at little additional cost.[170]

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164 *Id.*

165 *See id.* (reporting that 76% of adults with a high school degree or less, 91% with some college, and 97% with a college degree or higher use the internet).

166 *See id.* (reporting that 77% of adults earning less than $30,000 per year, 85% of those earning $30,000 to $49,999, 93% of those earning $50,000 to $74,999, and 99% of those earning over $75,000 use the internet).

167 *See supra* notes 80–88 and accompanying text.

168 *See* Walters, *supra* note 54, at 13 ("The Internet also enjoys the benefit of permitting a greater longevity of the class action notice than newspapers can afford. Rather than a one-time placement in a local or national newspaper for a day, the Internet can offer the same size notice placement or larger for weeks at a time.").

169 *Id.* at 14-15.

170 *See* Klonoff et al., *Making Class Actions Work*, *supra* note 66, at 750 ("The internet decreases the cost of giving [more expansive] notices and increases the likelihood that absent class members

Nor is the preceding discussion meant to suggest that the internet should be the only means through which courts and parties provide supplemental and constructive notice. For example, if a class action notice expert retained to design an effective notice program determines that internet notice is unlikely to reach a significant number of potential class members, or if the response rate is low, then another method should be used. Indeed, in class actions composed primarily of persons sixty-five or older, the internet is likely a poor means to disseminate notice, as only fifty-seven percent of persons in this group report using the internet.[171] Parties and courts would do better to use traditional means of notice in such actions. And even in actions where internet notice *is* appropriate, notice plans that utilize both traditional and contemporary methods are still advisable to reach the highest percentage of the potential class. They are also widely accepted by courts.[172]

Rather, this discussion has endeavored to demonstrate that the internet can play a more prominent role in providing notice to unknown class members. Relative to other means of communication, it offers a number of advantages, including cost and reach, which should make it a popular option among courts and parties. The internet should be the focal point of supplemental and constructive notice programs rather than an afterthought or "addendum to a more traditional notice scheme."[173]

Overall, courts are beginning to embrace the role that modern technology can play in providing notice. But courts and parties have only begun to scratch the surface. I now turn to a discussion of comparatively new technologies that may be of use in disseminating notice.

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will receive them. Courts should therefore increasingly rely on the internet to deliver these, and other, notices." (citations omitted)).

171 *Internet Use Fact Sheet*, *supra* note 162.

172 *See, e.g.*, Juris v. Inamed Corp., 685 F.3d 1294, 1319 (11th Cir. 2012) (holding that a notice plan satisfied Rule 23 and due process requirements where it sent individual notice to class members and published notice in national newspapers, magazines, online, on a dedicated site, and on the district court's website); *In re* Philips/Magnavox Television Litig., No. 09-3072, 2012 WL 1677244, at *14 (D.N.J. May 14, 2012) (approving a notice plan that provided notice using postcard notice to 22,652 class members, email notice to 42,939 class members, publication notice in *USA Today*, a website with frequently asked questions and other relevant information, a toll-free number, information on the plaintiff counsel's website, a press release to *PR Newswire*, and use of a search engine marketing campaign to direct class members to the settlement website); *Deepwater Horizon*, 910 F. Supp. 2d 891, 939-40 (E.D. La. 2012) (approving a plan where notice would be disseminated to class members through mail, email, local newspapers, radio, television advertisements, internet advertisements on sites like Google, consumer magazines, a national daily business paper, an internet site, and the court's website).

173 Ginsberg, *supra* note 70, at 762.

IV. New Technologies in Class Action Notice

A number of new technologies can help ensure that class members become aware of their rights and have the potential to reshape class action notice programs moving forward. First, parties can use machine learning systems, and the big data they rely on, both to identify potential class members and to determine the best means of reaching those identified. Second, social media is a relatively inexpensive way to reach a large audience and inform unknown class members of their rights. Finally, cellphones can put notice in the palms of class members' hands quickly and effectively. Currently, however, courts and parties are using these technologies sparingly or not at all. The current state of affairs ought to change. This Part reviews each technology in turn, detailing their relevant benefits and limitations.

A. *Machine Learning: Identifying Class Members and Tailoring Notice*

Machine learning systems[174] are a modern technology capable of finding patterns and complex relationships in tremendous amounts of data.[175] Courts and parties should consider using these systems in the class action context to identify unknown class members in order to send individual notice and to tailor notice plans to the specific class.

1. The Basics of Machine Learning

Machine learning systems allow users to analyze vast amounts of data to "determine trends and relationships that may not have otherwise been readily apparent" to a human observer.[176] The data they rely on—often referred to as big data due to its size—comes from "online transaction records, email messages and metadata, images, web-browsing logs, search queries, health records, social networking interactions, geolocation tracking, and sensors deployed in infrastructure."[177] To make sense of all this information, these

174 "Machine learning" is one of a number of concepts in the artificial intelligence field. Others, including "predictive analytics," "data mining," and "big data," are used interchangeably to describe similar processes. Michael L. Rich, *Machine Learning, Automated Suspicion Algorithms, and the Fourth Amendment*, 164 U. Pa. L. Rev. 871, 880 (2016). This Comment uses the term "machine learning" for clarity.

175 What follows is meant only as a cursory introduction to machine learning processes. For a detailed and technical discussion, see Ethem Alpaydin, Introduction to Machine Learning xxxii (2d ed. 2010), which introduces a unified treatment of the various machine learning-related methods from various fields, and Peter Flach, Machine Learning: The Art and Science of Algorithms that Make Sense of Data (2012), which introduces topics in machine learning.

176 Robert Sprague, *Welcome to the Machine: Privacy and Workplace Implications of Predictive Analytics*, 21 Rich. J.L. & Tech. 1, 3 (2014).

177 *Id.* at 4. The amount of data available is growing in a self-sustaining cycle: "[b]igger databases allow algorithms to make more connections, and more connections yield the ability to monetize

systems use algorithms derived "from computer science and principled inference methods from statistics" to recognize patterns and organize the data.[178] As one commentator has aptly described it, "Machine Learning is a field that seeks to harness today's exponential data deluge by finding patterns in it, making predictions from it, and efficiently organizing it."[179]

What makes machine learning systems particularly useful is their ability to analyze huge amounts of data and infer rules from that data with little human intervention. Systems learn and build accurate models based on their own independent analysis and do not require complex rules and algorithms at the outset.[180] Instead, the machine develops rules as it applies common statistical techniques to the dataset.[181] Put simply, machine learning systems are a highly efficient means of analyzing massive amounts of information.

Three types of machine learning systems exist: unsupervised, supervised, and semi-supervised. Unsupervised machine learning systems "automatically find[] dependencies, correlations, and clusters in the data without requiring any significant human intervention."[182] One can use such a system to "find[] groups of users in [a] dataset that appear statistically similar" and cluster them together.[183] Human investigators can then determine what the cluster represents and label it accordingly.[184] For example, by using geolocation data, an unsupervised system can determine that some people go to National Football

more data, which in turn creates even bigger databases." Fairfield & Luna, *supra* note 148, at 997 (citations omitted). There are no signs of slowing, as technology is being developed to store even larger quantities of data. *See id.* at 999-1000 (discussing the open-source platform Hadoop and concluding that "there are very few functional limits to the amount of data that may be kept"). Indeed, data is growing at a speed of 2.5 quintillion (2,500,000,000,000,000,000) bytes per day. ERIC SIEGEL, PREDICTIVE ANALYTICS: THE POWER TO PREDICT WHO WILL CLICK, BUY, LIE, OR DIE 78 (2013). "In 1986, the data stored by computers, printed on double-sided paper, could have covered the Earth's land masses; by 2011, it could have done so with two layers of books." *Id.* What is particularly impressive is that technology is able to parse these vast quantities of data in close to real time. *See* Fairfield & Luna, *supra* note 148, at 1000.

178 Steven M. Bellovin et al., *When Enough Is Enough: Location Tracking, Mosaic Theory, and Machine Learning*, 8 N.Y.U. J.L. & LIBERTY 555, 589 (2014).

179 *Id.*

180 *See* Harry Surden, *Machine Learning and Law*, 89 WASH. L. REV. 87, 93 (2014) ("[I]ts design enables it to continually refine its internal model by analyzing more examples and inferring new, useful patterns from additional data.").

181 *See id.* at 94 (detailing the ability of machine learning systems to build complex models incrementally, thereby avoiding the difficulty of designing a manual bottom-up modeling system).

182 Bellovin et al., *supra* note 178, at 590; *see also* Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact*, 104 CALIF. L. REV. 671, 678 n.24 (2016) ("'[U]nsupervised' learning do[es] not require any . . . target variables and instead search[es] for general structures in the dataset, rather than patterns specifically related to some state or outcome.").

183 Bellovin et al., *supra* note 178, at 591; *see also* Barocas & Selbst, *supra* note 182, at 678 n.24 ("Clustering is the most common example of 'unsupervised' learning, in that clustering algorithms simply reveal apparent hot spots when plotting the data in some fashion.").

184 Bellovin et al., *supra* note 178, at 591.

League (NFL) stadiums on Sundays in the fall and cluster this group together. A human investigator can then review this information and label this group as NFL fans.[185] Another use of unsupervised machine learning is inference analysis, during which the system finds correlations between two pieces of data based on their joint recurrence in the dataset.[186] Inference analysis can, for instance, "predict a user will probably visit the website espn.com frequently if that user has frequently attended sports events at stadiums."[187]

In supervised machine learning, humans label the data in the system, and the system then uses algorithms to detect correlations and patterns linking various pieces of information—"rules" which can be applied to data outside of the labeled set.[188] A supervised machine learning system can be used to classify individuals within a dataset.[189] For example, a human user might label the professions of individuals, based on information obtained from surveys, within a dataset containing other information such as age, education, ethnicity, subscription history, internet browsing history, and location. Call this the "Labeled Dataset." A machine learning system could then identify correlations and patterns within the Labeled Dataset connecting various factors to an individual's particular profession. For instance, the system might find that those persons labeled "law firm junior associate" are likely to have a six-figure income, to reside in metropolitan areas, to have a professional degree, to subscribe to *The New York Times* or *The Wall Street Journal*, and to have visited www.abovethelaw.com in the last three months. A human investigator could then use the system to apply the correlations and patterns derived from the Labeled Dataset (the rules) to non-labeled data to classify the likely professions of persons in that group.[190] The system could classify a person with a six-figure income, residing in a metropolitan area, with a professional degree and a subscription to *The New York Times* or *The Wall Street Journal*,

185 *See id.* at 591-92 (providing an example in which a machine learning system could cluster those who attend church on Sundays together, which in turn, would allow a human investigator to label these individuals as Christian).

186 *Id.*

187 *Id.*

188 *See* Rich, *supra* note 174, at 881 ("[In] 'supervised' machine learning . . . an algorithm learns from data that has already been 'labeled' with the target 'feature.' Features, in turn, are the 'language' that machine learning algorithms use[] to describe the objects within its domain. The only technological limit on the kind of characteristic that can be a feature is that it must be measurable. The machine learning process then creates a model based on the labeled dataset that can be used to predict the proper classification of future objects." (citations omitted)); *see also* Bellovin et al., *supra* note 178, at 593-94 (describing various uses of supervised machine learning systems).

189 Bellovin et al., *supra* note 178, at 593.

190 *See id.* (noting that "in addition to collecting location data, one may survey a small portion of the population and ask them to report their occupation" which could then be used to extrapolate new information about other individuals).

who has visited www.abovethelaw.com in the last three months as a likely "law firm junior associate." As these labels will necessarily rely on statistical correlations, they are not perfect. Rather, they produce a best guess at a person's profession based on the available information.

In addition, supervised machine learning systems can predict the future behavior of individuals by finding patterns in labeled datasets and applying these findings to unlabeled data.[191] The drawback of supervised machine learning systems is that they require a substantial amount of data, which involves the costly collection of labels.[192]

Finally, semi-supervised machine learning systems are, as the appellation suggests, a cross between their unsupervised and supervised counterparts.[193] These systems use more labeled data than unsupervised systems, but less than supervised systems, and are thus useful when raw labeled data are available for some but not all individuals.[194]

The "semi-supervised" designation is a matter of degree, not kind. Like supervised systems, they can classify individuals, but are able to do so with less data.[195] One could, for example, use a semi-supervised system to classify the unknown professions of persons in much the same way as a supervised system—by finding rules linking persons with known professions to other factors, such as education and location, and applying these rules to unlabeled data. The difference is the semi-supervised machine would do so using fewer persons with known professions, rendering it a less expensive alternative.[196] One way semi-supervised machines achieve similar ends with less data is through the use of network data—data reflecting relationships between

191 *Id.* at 594. In the criminal context, a machine learning system might be used to predict when a person engaged in particular criminal behavior: "One would begin with historical data about people containing a variety of features that might be relevant to predicting a certain kind of criminal activity, perhaps including their immutable personal characteristics (e.g., age, gender, race, religion), demographic information (e.g., address, salary, occupation), and specific activities (e.g., presence on a certain street corner at a certain time, patterns of flights, or specifics of tax returns). These data would also be labeled to indicate whether each included person was known to be engaged in the targeted criminal conduct or not. Machine learning methods would then be applied to these data to create a model that [the system] could apply to new data to predict which individuals are likely to be engaged in the targeted criminal activity." Rich, *supra* note 174, at 883 (citations omitted).

192 Bellovin et al., *supra* note 178, at 594.

193 *See id.*

194 *See id.* at 594-95. In other words, semi-supervised machine learning is useful when there is "raw input data as well as a target variable" for some individuals, but "only raw input data . . . without any human label annotation" for others. *Id.* at 595.

195 *Id.*

196 *See id.* at 593-95 (noting that in semi-supervised machine learning, "[a]s in supervised learning, on some individuals, we have raw input data as well as a target variable," but distinguishing semi-supervised learning on the grounds that "on the vast majority of other individuals, we only have raw input data (say, just location data) without any human label annotation," and further noting that the human annotation in supervised systems makes them costly).

people.[197] As an example, "people who spend much time together in similar locations (i.e., co-locate), would . . . allow an algorithm to infer the presence of a[] . . . relationship between those two individuals."[198] This relationship, in turn, allows the machine to infer information about unlabeled data from labeled data. Returning to the previous example, if persons A and B, who were known to be "law firm junior associates," co-located every workday in the same building as person C, the machine could infer that person C is also a "law firm junior associate."

Machine learning systems are becoming increasingly prominent in modern society: email providers like Google use them to identify spam emails, the medical profession uses them to help diagnose diseases, and insurers use them to perform risk evaluation.[199] Target famously used machine learning systems to predict whether a woman was pregnant and, if so, how far along she was in her pregnancy.[200] The company was able to do so using only a woman's purchase history, which revealed purchasing patterns correlated with pregnancy.[201] In another famous example, IBM's "Watson," a machine learning system, defeated two former champions on the popular trivia game show *Jeopardy!*.[202] In the legal field, one company is now using machine learning to analyze individual judges and their tendencies on the bench.[203] Machine learning systems are also commonly used in the legal field as part of predictive coding in electronic discovery.[204]

2. The Practicality of Machine Learning Systems and Class Action Notice

As an initial matter, it is important to ask whether machine learning systems can be used in the class action setting. Given the large number of firms that specialize in providing class action notice, the answer to that

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197 *Id.* at 595.

198 *Id.*

199 Rich, *supra* note 174, at 882.

200 *See* Charles Duhigg, *How Companies Learn Your Secrets*, N.Y. TIMES (Feb. 16, 2012), http://nyti.ms/18LN5uz [https://perma.cc/D2UW-4BLS] (reporting the media controversy that resulted from the corporation's use of this information to send coupons for childcare goods to customers whom the system determined were likely to be pregnant).

201 *Id.*

202 *See* Steve Lohr, *The Promise of Artificial Intelligence Unfolds in Small Steps*, N.Y. TIMES (Feb. 28, 2016), http://nyti.ms/1RyaIbf [https://perma.cc/M9YY-ZRBF] (discussing Watson's victory and how IBM has used the machine since that time).

203 *See* Danny Crichton, *With Judge Analytics, Ravel Law Starts to Judge the Judges*, TECH CRUNCH (Apr. 16, 2015), http://techcrunch.com/2015/04/16/who-judges-the-judges [http://perma.cc/3KGV-6CW7] (discussing how Ravel Law uses modern analytics to help lawyers better understand judges).

204 For a discussion of such uses, see Christina T. Nasuti, Comment, *Shaping the Technology of the Future: Predictive Coding in Discovery Case Law and Regulatory Disclosure Requirements*, 93 N.C. L. REV. 222, 234-39 (2014).

question is a resounding yes.[205] These firms are capable of both acquiring the necessary data and providing the attending analytical work.

In order to be effective, machine learning systems require a significant amount of data.[206] One way class action notice firms could procure this data is by purchasing it from third party companies that sell data for others to use.[207] Acxiom,[208] for example, aggregates and sells "data from a variety of sources, including financial services companies, court records and federal government documents."[209] Similarly, Datalogix[210] "claims to have a database on the spending habits of more than 100 million Americans in categories like fine jewelry, cough medicine and college tuition."[211] Companies that sell information gleaned from social media have even emerged.[212] This data is fairly inexpensive—companies sell user profiles in large batches for approximately $0.005 per profile (e.g., 10,000 profiles for $50 total).[213] Alternatively, class action notice firms could access one of the many free datasets available online.[214] In any event, firms can procure the needed data at little or no cost.

Class action notice firms are also capable of analyzing this data. Because many companies already provide data analysis for organizations with the "data but not the technological workforce to analyze them," class action notice firms could feasibly contract with third parties for analysis purposes.[215] Alternatively,

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205 For a sample of class action notice firms, see Klonoff et al., *Making Class Actions Work*, *supra* note 66, at 734 n. 50.

206 *See supra* text accompanying note 177.

207 *See* Duhigg, *supra* note 200 ("[Companies] can buy data about your ethnicity, job history, the magazines you read, if you've ever declared bankruptcy or got divorced, the year you bought (or lost) your house, where you went to college, what kinds of topics you talk about online, whether you prefer certain brands of coffee, paper towels, cereal or applesauce, your political leanings, reading habits, charitable giving and the number of cars you own.").

208 ACXIOM, http://www.acxiom.com [https://perma.cc/X3UG-P68F].

209 Sengupta, *supra* note 149.

210 *Oracle and Datalogix*, ORACLE, http://www.oracle.com/us/corporate/acquisitions/datalogix/index.html [https://perma.cc/8R8L-ACFZ].

211 Sengupta, *supra* note 149.

212 *See, e.g.*, PeopleBrowsr, Inc. v. Twitter, Inc., No. C-12-6120, 2013 WL 843032, at *1 (N.D. Cal. Mar. 6, 2013) ("The 'Twitter Big Data Analytics' market, in which PeopleBrowsr operates, consists of companies that use data mining techniques to derive insights from the flow of information generated on Twitter."). This is not surprising, considering the world writes the equivalent of a ten million-page book in tweets each day. SIEGEL, *supra* note 177, at 77.

213 *See* Alexis C. Madrigal, *How Much Is Your Data Worth? Mmm, Somewhere Between Half a Cent and $1,200*, ATLANTIC (Mar. 19, 2012), http://www.theatlantic.com/technology/archive/2012/03/how-much-is-your-data-worth-mmm-somewhere-between-half-a-cent-and-1-200/2544730 [http://perma.cc/8BZJ-2D7V] (noting that user profiles are sold in "large chunks" of at least 10,000 and "[o]n the high end, [] go for $0.005 per profile").

214 *See* SIEGEL, *supra* note 177, at 75-76 (noting that a number of free data sets are available online).

215 Sean Fahey, *The Democratization of Big Data*, 7 J. NAT'L SECURITY L. & POL'Y 325, 329 (2014). Indeed, class action notice firms already routinely contract with outside organizations when, for example, they seek to define target audiences and determine the best means to reach them. *See, e.g.*, Varacallo v. Mass. Mut. Life Ins. Co., 226 F.R.D. 207, 226 (D.N.J. 2005) ("By working with a

firms could develop their own internal analytics departments. The former approach is more appropriate if the firm anticipates using machine learning systems in only a few cases, allowing it to purchase the requisite analysis on an as-needed basis. If, however, the firm expects to use machine learning systems in a large number of cases, the latter approach would be preferable because it would enable the firm to refine its in-house systems for use in any number of cases and to save future costs.

3. How Machine Learning Systems Can Benefit Class Action Notice

Having established that class action notice firms are capable of using machine learning systems, it is important to consider *how* they would employ such systems. There are at least two conceivable uses of machine learning systems in the class action context: (1) to identify unknown class members and (2) to tailor notice plans to the class's likely media usage. I discuss each in turn.

a. *Identifying Unknown Class Members*

Where the identities of at least some individual class members are unknown, machine learning systems may be able to identify these parties. Doing so would allow courts and parties to direct individual notice to those persons.

Employing a machine learning system in this manner seems particularly useful in large consumer class actions, where it is often difficult to identify every individual who purchased a given product. A class action notice firm might first compile a large database of consumer profiles by purchasing the necessary information or by accessing its own data (the Consumer Dataset). It would then label known purchasers of a product within the Consumer Dataset using a computer program to match the names and other identifying information of persons who had, for instance, purchased a product warranty[216] or a product with a store loyalty rewards card,[217] to their consumer profile, if present (the Labeled Dataset).[218] A machine learning system could then review

nationally syndicated media research firm, the Notice Administrator was able to define a target audience for the MassMutual Class Members which provided a valid basis for determining the magazine and newspaper preferences of the Class Members.").

216 *See In re* Pool Prods. Distrib. Mkt. Antitrust Litig., 310 F.R.D. 300, 318 (E.D. La. 2015) (using information from product warranties to email notice to identifiable class members).

217 *See* Sengupta, *supra* note 149 (noting that companies collect and sell data derived from "store loyalty card transactions").

218 This process is often called data or computer matching, which one commentator has defined as "the computerized comparison of two or more systems of records." Daniel J. Steinbock, *Data Matching, Data Mining, and Due Process,* 40 GA. L. REV. 1, 10 (2005). Regardless of the name, these processes are used in a number of areas. *See id.* at 11-12 (offering examples, including "reducing fraud, waste, and abuse of government benefit programs, such as food stamps or Medicare").

various factors and characteristics—such as demographic information, purchase histories, web browsing histories, and social media activity—to discern patterns and develop rules linking those within the Labeled Dataset to the purchase of a given product. Based on the derived patterns and rules, the system could then classify unlabeled individuals within the Consumer Dataset—potential unknown class members—according to who is likely to have purchased the product. That is, based on patterns found in the Labeled Set, the machine could identify that Jane Doe, an unlabeled individual in the Consumer Dataset, has, for example, an eighty percent probability of having purchased product Y. Given these results, a firm could then send individual notice, via email or mail, to persons with a certain likelihood of having purchased the product and, therefore, with a certain likelihood of being part of the class.

A hypothetical application of machine learning systems to a real-world class action illustrates the benefits such systems could yield in this context. The class in *Lima v. Gateway* included "[a]ll persons or entities in the United States who [we]re original purchasers of a Gateway 30" XHD 3000 LCD Monitor."[219] In its preliminary settlement approval, the court approved a notice plan proposing to mail and email notice to known class members, and to publish notice in print and on the internet to notify unknown class members.[220]

Rather than relying on supplemental notice in print and on the internet, a class action notice firm using a machine learning system could likely identify at least some of the unknown class members and provide them with individual notice. The firm would first compile a large database of tens or perhaps hundreds of millions of consumer profiles, and the extensive information contained therein (the Consumer Dataset).[221] It would then match the information of known class members—names, addresses, and the like—to their consumer profiles in this dataset,[222] and extract their profiles to create a separate dataset (the Labeled Dataset). The Labeled Dataset would thus be comprised of known purchasers of a Gateway 30" XHD 3000 LCD Monitor and related identifying information. Then, by reviewing the information in the Labeled Dataset, a machine learning system could find correlations and patterns linking known purchasers to the product. The system might find, for example, that persons who have visited Gateway's homepage, subscribe to *The New York Times*, and live in the suburbs have an eighty percent chance of

219 Plaintiff's Notice of Motion and Motion for Final Approval of Class Action Settlement; Memorandum of Points and Authorities in Support Thereof at 4, Lima v. Gateway, Inc., No. 8:09-CV -01366-DMG-AJW (C.D. Cal. Jan. 23, 2015), ECF No. 114, 2015 WL 11110883.

220 *Id.* at 5.

221 *See supra* text accompanying notes 207–214.

222 *See* Steinbock, *supra* note 218, at 10-16 and text accompanying note 218.

having purchased the product.[223] The machine could then apply the derived rules to information in the Consumer Dataset to identify persons therein who are statistically likely to have purchased the product. Under the rule derived above, for example, the system would be able to identify that an individual who has visited Gateway's homepage, subscribes to *The New York Times*, and lives in the suburbs has an eighty percent chance of having purchased the product. Finally, the notice firm would send individual notice to those newly identified potential class members.

As another example, consider *DeHoyos v. Allstate Corp.*, a class action on behalf of black and Hispanic policyholders who sued their insurance provider Allstate alleging that the company's credit-scoring system caused them to pay higher premiums than white policyholders.[224] Because Allstate did not have records of the ethnicities or races of its policyholders, the court found the parties could not identify individual class members with reasonable effort for the purposes of providing individual notice.[225] It instead approved a notice plan seeking to publish notice in national magazines, in magazines with large black and Hispanic readerships, and in English and Spanish newspapers.[226]

Machine learning systems would improve notice in cases such as *DeHoyos*. A notice firm would first create a targeted dataset consisting exclusively of Allstate customers and any available information pertaining to them, using an automated computer program to match the names, addresses, and other identifying information (obtained from Allstate's records) to individual profiles within a larger database of consumer profiles (the Consumer Dataset).[227] The firm would then remove those consumer profiles without a match, yielding a database containing consumer profiles—and the vast amounts of information contained therein—of Allstate customers only (the Allstate Dataset). Because large datasets often contain information about race and ethnicity,[228] a machine learning system could mine the data in the Allstate Dataset and cluster the customer profiles based on race and ethnicity.[229] A human investigator would label the clusters accordingly, and the firm would then send notice to persons the system identified as likely to be black or

223 These factors are merely for illustration and do not purport to actually indicate the likelihood that an individual purchased a product from Gateway. This rule is also simplified for purposes of the illustration. Machine learning systems are capable of drawing significantly more complex inferences.

224 240 F.R.D. 269, 275 (W.D. Tex. 2007).

225 *Id.* at 296.

226 *Id.* at 297-98.

227 *See* Steinbock, *supra* note 218, at 10-16.

228 *See* Duhigg, *supra* note 200 (noting that companies can buy data that includes information about individuals' ethnicities).

229 *See supra* text accompanying note 185 (describing how machine learning systems can cluster individuals based on whether they go to NFL stadiums on Sundays in the fall using geolocation data).

Hispanic. In short, computers could thin a large consumer database to one containing Allstate customers only, and then use a machine learning system to identify the likely race and ethnicity of these customers with the aim of providing individual notice to potential class members.[230]

The critical shortfall in traditional substitute notice programs—those that use traditional mediums to provide supplemental or constructive notice—is their reliance on the legal fiction that class members will happen to see notice in a newspaper or in a television advertisement on the day it is available, and in this way, become aware of their rights. This shortfall is the reason individual notice is the preferred means of disseminating notice.[231] But machine learning systems may allow courts and parties to do what these traditional mediums cannot. By combing through and systematizing vast accumulations of otherwise unintelligible data, machine learning systems provide the means to discover previously unknown class members and provide them with the gold standard of notice: individual notice.[232] In other words, machine learning systems may facilitate individual notice to some previously unidentified class members,

230 It is doubtful that this process would identify *all* black and Hispanic policyholders for three reasons. First, the larger Consumer Dataset would likely not include every Allstate client to match to the Allstate Database because large consumer databases simply cannot include every individual. Thus, a firm would not be able to send individual notice to those unidentified persons through this means. Second, the Consumer Dataset may not include data on every client's race or ethnicity. Thus, the machine would be unable to cluster these individuals based on this factor and a firm would likely be unable to send individual notice to some black or Hispanic policyholders. Third, assuming that a computer program is incapable of perfectly matching the names, addresses, and other identifying information in the Consumer Dataset to Allstate's records, the Allstate Database might include persons who are not actually Allstate customers. That is, the computer matching program might make mistakes and identify someone as an Allstate customer who is not one. So, inevitably, the database would be both over- and under-inclusive and would not permit complete individual notice. Courts and parties would need to provide supplemental notice, a point addressed more fully below. *See infra* Part IV.A.4. Notably, a machine learning system could also allow a notice firm (or an outside expert) to predict the race and ethnicity of an Allstate customer based on that person's name. One company has already employed this method. *See* Perry Garfinkel, *A Linguist Who Cracks the Code in Names to Predict Ethnicity*, N.Y. TIMES (Oct. 15, 2016), http://nyti.ms/2e7NoFD [https://perma.cc/YWQ4-BYGF] (quoting Lisa Spira, director of research and product development at Ethnic Technologies, who "lead[s] a team that develops our software that predict individuals' ethnic origins based on their full names, addresses and ZIP codes [and] builds predictive algorithms based on patterns in names from various ethnic groups"). One employee explained the process as follows, "Let's hypothetically take the name of an American: Yeimary Moran. We see the common name Mary inside her first name, but unlike the name Rosemary, for example, we know that the letter string 'eimary' is Hispanic. Her surname could be Irish or Hispanic. So then we look at where our Yeimary Moran lives, which is Miami. From our software, we discover that her neighborhood is more Hispanic than Irish. Customer testing and feedback show that our software is over 90 percent accurate in most ethnicities, so we can safely deduce that this Yeimary Moran is Hispanic." *Id.*

231 *See* Eisen v. Carlisle & Jacquelin, 417 U.S. 156, 175 (1974) (recognizing that publication notice had "long been a poor substitute for actual notice").

232 *See* FED. R. CIV. P. 23(c)(2)(B) (requiring courts to direct "individual notice to all members [of the class] who can be identified through reasonable effort").

rather than leaving courts and parties to rely exclusively on substitute notice schemes. The possibility of expanding the individual notice pool suggests that courts and parties should consider using machine learning systems to fulfill their obligation to provide the best notice practicable.

b. *Tailoring Notice*

Courts and parties can also improve notice plans by using machine learning systems to determine the means of communication most likely to reach a given class, tailoring the notice plan accordingly. Such tailoring efforts would be useful in actions for which notice was to be disseminated beyond individual notice.

Returning to the facts of *Lima*, a firm could use the identifying information of known purchasers of the Gateway product at issue and employ computer matching to link the person to their consumer profile in a larger database.[233] The firm could then remove profiles without a match to create a dataset composed exclusively of class members (the *Lima* Dataset). A machine learning system could then cluster members according to media use. Information from browsing histories, for example, could produce clusters based on the sites class members visited, while subscription records could produce clusters based on magazine readership. The notice firm could then use the information derived to distribute notice via the most popular media outlets.

In the alternative, if the firm had information about some but not all class members' media use, it could use the *Lima* Dataset and employ a machine learning system to find factors and patterns linking class members with known media preferences to their particular preferences. The system could then use the rules derived to identify the likely media preferences of class members with unknown preferences. More concretely, in *Lima*, a firm could conduct a survey asking known class members about their media usage. Using the information obtained from responding class members, the notice firm could create the Labeled Dataset. A machine learning system could then discern patterns linking class members in the Labeled Dataset to particular media uses. The system could discover, for instance, that a person with a post-graduate degree, living in a metropolitan area, with a six-figure income has an eighty percent likelihood of reading *The New York Times* online. Applying the system-derived rules to class members in the *Lima* Dataset, the machine could predict the various forms of media used by members with unknown media preferences and then classify them accordingly. Ultimately, the machine would be able to determine that Jane Doe—who has a post-graduate degree, lives in a metropolitan area, and has a six-figure income—has an eighty

233 *See* Steinbock, *supra* note 218 and text accompanying note 218.

percent chance of reading *The New York Times* online. Ideally, class counsel would provide notice through the most popular types of media.

Using machine learning systems to tailor notice in this manner would improve the likelihood of providing actual notice to the class. Like online advertising, machine learning systems go beyond educated guesses about which radio programs and newspapers class members are likely to listen to or read. Instead, these systems rely on comprehensive data and individualized analysis to understand a given class's media usage. And machine learning systems build upon the benefits of online advertising insofar as such systems can be used to understand class members' media uses beyond the internet. Because due process considerations and the best-notice-practicable standard require courts to employ the means most likely to result in actual notice,[234] courts and parties should, at the very least, consider using machine learning systems to tailor notice programs.

4. The Limitations of Machine Learning Systems

Notwithstanding the benefits of machine learning systems, courts and parties would do well to keep a few important limitations in mind. Principally, machine learning systems require representative data to ensure they develop rules that are generally applicable and not simply reflective of the given data.[235] Humans provide the data based on judgments about what information is relevant, introducing the possibility of human error.[236] As a result, courts need to play a supervisory role and ensure that a neutral expert, with experience using machine learning systems, reviews the proposed dataset to confirm that it is representative and likely to yield practicable rules. If the notice firm has the relevant experience and expertise using these systems, its internal review should suffice. If not, however, the court may need to appoint a third-party expert.[237] Engaging an expert will protect the rights of class members by preventing class counsel from skewing the results, intentionally or unintentionally, with unrepresentative information.

In addition, because the results of machine learning processes are based on correlations, they are not perfectly accurate.[238] Inaccuracies can be reduced,

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234 *See supra* note 40 and accompanying text.

235 *See* Surden, *supra* note 180, at 106 ("The concern, in other words, would be relying upon an algorithm that is too attuned to the idiosyncrasies of the past case data that is being used to train a legal prediction algorithm.").

236 *See* Rich, *supra* note 174, at 885 ("[T]he choices made by humans throughout the machine learning process can cause inaccuracies in the final predictions of a machine learning algorithm.").

237 *See* FED. R. EVID. 706(a) (allowing the court to appoint an expert witness).

238 *See* Rich, *supra* note 174, at 883 ("[W]hen machine learning methods are used to model complex casual systems, they necessarily rely on approximations.").

however, by using large, representative datasets,[239] which can be vetted and reviewed by experts. Still, courts and parties should not rely exclusively on machine learning systems. When using such systems to provide individual notice, it is best to also provide supplemental notice through, for example, banner advertisements or keyword search results. Doing so ensures that class members will have a number of opportunities to learn of their rights.

Relatedly, because machine learning systems are based on approximations, they may produce results that are both over- and under-inclusive, leading to notice that is likewise over- and under-inclusive. Considering, however, that traditional publication notice in newspapers and magazines introduces the same possibility, this issue should not deter the use of machine learning systems. Moreover, over- and under-inclusiveness would likely be less problematic in the machine learning context, as such systems aim to pare down the potential audience and identify class members based on individual analysis.

Finally, the costs associated with machine learning systems do not necessarily present a barrier to their use for purposes of class action notice, as Rule 23 requires parties to use "reasonable effort" to identify individual class members.[240] As the Fifth Circuit explained in a seminal case,

> [R]easonableness is a function of anticipated results, costs, and amount involved. A burdensome search through records that may prove not to contain any of the information sought clearly should not be required. On the other hand, a search, even though calculated to reveal partial information or identification, may be omitted only if its cost will exceed the anticipated benefits.[241]

Based on these considerations, the Fifth Circuit required the plaintiffs to review 1.7 million Retail Delivery Report cards by hand, despite the district court's characterization of such efforts as a "herculean task" and an "unnecessarily time consuming and burdensome process."[242] In doing so, the Fifth Circuit noted, "While the mechanical process of examining the cards may prove to be expensive and time-consuming, the individual right of absentee class members to due process makes the cost and effort reasonable."[243]

Similarly, in *Larson v. AT & T Mobility LLC*, the Third Circuit found that a search of records, which could reveal the names of potential class members at a cost of $100,000 and four to five months of work, was not necessarily

239 *Id.*

240 FED. R. CIV. P. 23(c)(2)(B).

241 *In re* Nissan Motor Corp. Antitrust Litig., 552 F.2d 1088, at 1099 (5th Cir. 1977).

242 *Id.* at 1096.

243 *Id.* at 1100.

unreasonable given other cases requiring more costly efforts.[244] The court also noted that use of a computer program to search various databases seemed "less significant"[245] than the manual searches required in *Eisen*,[246] *Nissan*,[247] and similar cases.[248]

As these cases show, courts will require parties to expend considerable resources to provide individual notice in order to protect the due process rights of potential class members. The potentially high costs of machine learning systems may, therefore, be justified in a particular case if such a system would allow parties to identify class members and provide them with individual notice.[249] Of course, machine learning systems will not be appropriate or necessary in all cases, including, for example small class actions with a known class. Instead, courts and parties, with the aid of a class action notice expert, will need to determine whether the predicted costs of acquiring the data and conducting the analysis exceed the predicted likelihood of being able to identify potential class members. If the costs outweigh the benefits, parties should not be required to use such a system.[250]

In short, machine learning systems are capable of analyzing huge amounts of otherwise indecipherable data to better allow class action notice firms to identify potential class members and tailor notice plans. Although these systems have limitations, their potential to improve notice programs necessitates that courts and parties at least consider their use as part of their obligation to provide the best notice practicable under the circumstances.

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244 *See* 687 F.3d 109, 122, 129 (3d Cir. 2012) (noting that a search of Sprint's billing records would plausibly "bring the effort required within the range of reasonableness.").

245 *Id.* at 129.

246 *See* 417 U.S. 156, 166-67 (1974) (finding that "the names and addresses of an additional 250,000 persons" could be identified with reasonable effort).

247 *See* 552 F.2d at 1096 (requiring the examination of 1.7 million records to identify the class members' names).

248 *See Larson*, 687 F.3d at 129.

249 It is worth emphasizing that the use of an automated program seems less costly and time consuming than the manual searches that courts have approved in the past.

250 In addition to the concerns discussed in this Section, privacy concerns attend any use of "big data" and machine learning systems. Other commentators have written extensively about such concerns, but they are beyond the scope of this Comment. For a discussion of some of the privacy implications associated with big data and machine learning, see generally NEIL RICHARDS, INTELLECTUAL PRIVACY: RETHINKING CIVIL LIBERTIES IN THE DIGITAL AGE (2015), which argues that when privacy and free speech conflict, the latter should usually prevail; Jane Yakowitz Bambauer, *The New Intrusion*, 88 NOTRE DAME L. REV. 205 (2012), which argues that information harms are best suited to treatment under tort law, as opposed to privacy law; Ian Kerr & Jessica Earle, *Prediction, Preemption, Presumption: How Big Data Threatens Big Picture Privacy*, 66 STAN. L. REV. ONLINE 65, 71 (2013), which concludes that "big data" enables "preemptive social decision making," a feature "antithetical to privacy and due process values"; and Neil M. Richards & Jonathan H. King, *Big Data Ethics*, 49 WAKE FOREST L. REV. 393 (2014), which devises a four-pronged approach to "Big Data Ethics" and suggests ways in which this plan could be integrated in society and the law.

B. *Social Media*

Social media sites like Facebook, Twitter, and LinkedIn are a mainstay of modern society. In 2016, Facebook had roughly 1.79 billion users worldwide,[251] Twitter had roughly 317 million users,[252] and LinkedIn had roughly 467 million users.[253] Indeed, today it is surprising for someone to have no social media presence.[254]

Given the ubiquity of social media, courts and parties should consider using such platforms more frequently to provide notice. Specifically, parties could send Facebook messages to prospective class members, post notice on the defendant's Facebook page and/or Twitter account, or post statuses and/or tweet about the class action in general, all in an effort to supplement other forms of notice and ensure that class members are apprised of their rights.

1. Facebook Messaging

Parties can use Facebook messaging to send notice to known class members. This would not be the first time the law has intersected with Facebook messaging: the Supreme Court of the Australian Capital Territory has already allowed service of process via Facebook message.[255] In the class action context, a notice firm, using either human investigators or computer matching, could search the names and other information of class members—such as city of residence—on Facebook using Facebook's search bar to locate the person's Facebook profile. The firm could then send a Facebook message containing notice to class members who were discoverable on Facebook.

Notice via Facebook message would be useful to supplement other direct forms of individual notice, such as email or mail. It would serve as another means by which to notify class members of their rights in the event that members either

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251 *Number of Monthly Active Facebook Users Worldwide as of 3rd Quarter 2016 (in Millions)*, STATISTA, http://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide [https://perma.cc/FBD9-TPWU].

252 *Number of Monthly Active Twitter Users Worldwide from 1st Quarter 2010 to 3rd Quarter 2016 (in Millions)*, STATISTA, http://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users [https://perma.cc/3CNG-WVQ4].

253 *Numbers of LinkedIn Members from 1st Quarter 2009 to 3rd Quarter 2016 (in Millions)*, STATISTA, http://www.statista.com/statistics/274050/quarterly-numbers-of-linkedin-members [https://perma.cc/DA4P-GB79].

254 Michelle Ruiz, *Meet the Renegades Who Shun Social Media*, VOGUE (Oct. 14, 2016, 2:17 PM), http://www.vogue.com/article/dark-on-social-media-abstainers [https://perma.cc/AZU5-3ELB] (describing individuals who lack an "internet footprint" as "rebels," "renegades," and "in the minority").

255 For a discussion of the case and its implications for the American legal system, see generally Andriana L. Shultz, Comment, *Superpoked and Served: Service of Process via Social Networking Sites*, 43 U. RICH. L. REV. 1497 (2009).

did not receive or did not take seriously a letter or email containing notice, possibly assuming, for example, that a previously received email was a scam.

Facebook messaging could not, however, serve as a substitute for individual notice through email or mail as it is doubtful whether a party could send Facebook messages to an entire class. Some people simply do not use Facebook, and of those who do, not everyone uses their legal name as it would appear on a class list; some people, for instance, use fake names to protect their privacy.[256] Another concern is that a person may not treat notice received via Facebook seriously. Given the novelty of using Facebook in this manner, it is not unreasonable to think that someone would consider notice by Facebook message to be a scam.

2. Notice Posted on a Defendant's Social Media

A party might also provide notice by posting on a defendant's Facebook or Twitter page. On Facebook, this would prompt email notifications to the defendant's "fans."[257] On both Facebook and Twitter, posting would cause notice to appear publicly, on either the defendant's Facebook timeline or Twitter page, where class members could see it. Given the millions of followers that companies enjoy on social media, such as the 23.5 million Facebook users who "like" Target,[258] posted notice has the potential to reach a large number of people. While at least one court has already used social media to post notice,[259] courts and parties should expand their use of this medium.

3. Social Media of Class Counsel or Class Representatives

Class counsel or class representatives could also post about the class action on their own social media profiles. One court allowed this in a class action involving former interns suing the internet site Gawker.[260] In that case, and in cases with similar plaintiffs, social media seems to be a particularly

256 *See* Alex Hern, *Facebook Relaxes 'Real Name' Policy in Face of Protest*, GUARDIAN (U.K.) (Nov. 2, 2015, 6:19 PM), http://www.theguardian.com/technology/2015/nov/02/facebook-real-name-policy-protest [https:perma.cc/V9VN-KQXW] (discussing Facebook's attempts to ensure that users provide their real names).

257 Kelly v. Phiten USA, Inc., 277 F.R.D. 564, 569 (S.D. Iowa 2011) (explaining that notice displayed on the defendant's Facebook page directed email notification to more than 75,000 fans).

258 *Target*, FACEBOOK, https://www.facebook.com/target/?fref=ts [https://perma.cc/67AM-D37B].

259 *See Kelly*, 277 F.R.D. at 569-70 (approving a notice plan where the defendant posted information about the class action settlement on its Facebook page).

260 *See* Mark v. Gawker Media LLC, No. 13-cv-4347, 2015 WL 2330274, at *1 (S.D.N.Y. Apr. 10, 2015) (approving plaintiffs' "request to disseminate notice through social media"); Josh Eidelson, *Hey, Can You 'Like' My Lawsuit?*, BLOOMBERG (Mar. 5, 2015, 5:13 PM), http://www.bloomberg.com/news/articles/2015-03-05/gawker-lawsuit-plaintiffs-plan-social-media-class-action-quest [https://perma.cc/JWE5-LUQJ] (discussing the Gawker lawsuit's implications for allowing notice though social media).

appropriate means of providing notice. It stands to reason that interns—people working in temporary positions—may change addresses frequently and, consequently, be difficult to reach through traditional means. Instead of trying to obtain current addresses for the class, the plaintiffs provided notice where the class was as or more likely to see it: on social media.

4. The Benefits of Social Media

Two reasons militate in favor of employing social media more often in notice practices. First, social media offers a means by which courts and parties can reach a vast and diverse audience almost anywhere in the country.[261] Seventy-four percent of all internet users use social media in some capacity.[262] Moreover, use is roughly similar across various demographics. With respect to education level, 72% of internet users with a high school degree or less, 78% of internet users with some college, and 73% of internet users with a college degree or greater use social media.[263] Likewise, 79% of internet users who earn less than $30,000 per year, 73% of internet users who earn $30,000 to $49,999 per year, 70% of internet users who earn $50,000 to $74,999 per year, and 78% of internet users who earn $75,000 or more per year use social media.[264]

Second, using social media to disseminate notice is "fast, easy, and inexpensive."[265] Writing a Facebook post would take minutes at most and cost virtually nothing. While finding the Facebook profiles of class members in order to send messages would take time and money (in terms of labor costs), this is no less true of packing envelopes or searching the NCOA database for updated addresses. Using social media would simply require a different allocation of resources, which should be attractive given its reach and relatively low costs otherwise. This is not to suggest that disseminating notice through Facebook messages will be cost-effective in all instances. Depending on the size of the class and the amount of the settlement, it might be too costly. Still, where

261 Indeed, the potential reach and importance of social media was on full display during the last American presidential election, where President Trump harnessed Twitter, in a way no other candidate for public office has to date, to disseminate and shape his message. *See* Amber Phillips, *The Surprising Genius of Donald Trump's Twitter Account*, WASH. POST (Dec. 10, 2015), https://www.washingtonpost.com/news/the-fix/wp/2015/12/10/reading-6000-of-his-tweets-has-convinced-us-donald-trump-is-a-social-media-master/?utm_term=.64aa4ecfd0a1 [https://perma.cc/3EFD-A6YT] (detailing then-candidate Trump's use of Twitter to support his campaign).

262 *Social Networking Fact Sheet*, PEW RESEARCH CTR. (Dec. 27, 2013), http://www.pewinternet.org/fact-sheets/social-networking-fact-sheet [http://perma.cc/E6D4-U2AE] [hereinafter *Social Networking Fact Sheet*].

263 *Id.*

264 *Id.*

265 Shultz, *supra* note 255, at 1524.

the resources are available, Facebook messaging should be used to supplement individual notice.

5. The Limitations of Social Media

There are, nevertheless, several limitations to social-media disseminated notice. Principally, not everyone uses social media.[266] This is particularly true of persons from older generations. While 89% of individuals aged 18 to 29 and 82% of individuals aged 30 to 49 use social media, only 65% of individuals aged 50 to 64 and 49% of individuals aged 65 and older do so.[267] Because of this limited use, social media is far less valuable where the class consists largely of members 50 and older. Courts and parties should therefore restrict the use of notice by social media to classes composed of younger individuals.

Another limitation of social media is the difficulty of determining the reach and the frequency of notice disseminated through this medium;[268] that is, it may be difficult to determine how many people saw the notice and how often. If, however, social media is employed as part of a larger notice plan, as opposed to stand-alone notice, this limitation is less concerning.

Courts are starting to approve notice plans that utilize social media, recognizing the power of such platforms to reach a large and diverse class at low costs. More courts should follow this lead where appropriate, keeping in mind social media's inherent limitations.

C. *Text Messaging*

Like the internet, cellphones are reshaping contemporary society. Most adults own a cellphone,[269] and they seem to carry them everywhere—"[cellphones] are now such a pervasive and insistent part of daily life that the proverbial visitor from Mars might conclude they were an important feature of human anatomy."[270] Because of the widespread use of cellphones, parties and courts should consider sending class action notice via text message in three situations.

First, where the class list contains the mobile numbers of class members, courts and parties should consider using text messaging to disseminate notice. Such notice would supplement individual notice and remind class members

266 *See Social Networking Fact Sheet*, *supra* note 262 (reporting that twenty-six percent of adults do not use social media).

267 *Id.*

268 *See* Locke, *supra* note 143 (discussing the difficulties of measuring the reliability of notice by social media due to the constantly evolving nature of the medium).

269 *Mobile Technology Fact Sheet*, PEW RESEARCH CTR. (Dec. 27, 2013), http://www.pewinternet.org/fact-sheets/mobile-technology-fact-sheet [https://perma.cc/6GRZ-XQFT] [hereinafter *Mobile Technology Fact Sheet*] (reporting that ninety percent "of American adults own a cellphone").

270 Riley v. California, 134 S. Ct. 2473, 2484 (2014).

of their rights in the pending action, while also encouraging them to take notice seriously (because, presumably, a putative class member is more likely to take notice received through multiple mediums seriously).

Courts and parties should also consider using text messaging in class actions against cellphone companies. Such notice would be practical in these circumstances because the defendant company would have easy access to the mobile numbers of their customers and they have systems in place to facilitate mass texting.[271] Mobile customers are also accustomed to receiving text messages containing service announcements from their providers. Therefore, they may be less likely to treat such messages as spam.

Third, class action notice via text message seems particularly appropriate where a class is geographically concentrated, including mass disaster litigation such as the B.P. Oil Spill.[272] Notice could be sent via text message to persons with area codes affected by the disaster. Under such circumstances, text message notice could prove crucial in providing the best notice practicable, as disasters often displace homeowners and force temporary relocations.[273] Assuming disaster victims are likely to take their cellphones with them, text message notice could provide a solution to the vexing notice issues inherent to mass disasters.

The principal advantage of sending notice via text message is that many adults own cellphones and use them to text,[274] making it easy to reach a high percentage of a class with known cellphone numbers, or members sharing a particular area code. Moreover, sending a text message imposes very few costs; certain plans offer unlimited texting for a flat monthly fee, and those that charge per text only charge twenty cents.[275] Finally, cellphone use is widespread across various demographic segments. Use is comparable between men and

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271 *See In re* AT&T Mobility Wireless Data Servs. Sales Tax Litig., 789 F. Supp. 2d 935, 968 (N.D. Ill. 2011) (approving a notice plan that included sending text messages to thirty-two million current AT&T customers).

272 For highlights of the B.P. Oil Spill litigation, see *BP 2010 Oil Spill Settlement: A Timeline of Litigation*, NBC NEWS (July 2, 2015), http://www.nbcnews.com/news/us-news/bp-oil-spill-settlement-timeline-litigation-n385736 [https://perma.cc/8C2C-EXER].

273 *See, e.g.*, James Dao et al., *New Orleans is Awaiting Deliverance*, N.Y. TIMES (Sept. 2, 2005), http://nyti.ms/1R2iEUS [https://perma.cc/Y6PB-PWH2] (discussing the aftermath of Hurricane Katrina and the displacement of thousands of New Orleans residents).

274 *See Mobile Technology Fact Sheet*, *supra* note 269 (reporting that eighty one percent of cellphone owners user their phones to send or receive text messages).

275 Tim Worstall, *No, It Does Not Cost 1/1000th of a Penny to Send a Text Message*, FORBES (Nov. 13, 2012, 11:03 AM), http://www.forbes.com/sites/timworstall/2012/11/13/no-it-does-not-cost-11000th-of-a-penny-to-send-a-text-message [https://perma.cc/XC9V-9JL3].

women,[276] among persons of different races,[277] and across income[278] and education levels.[279] Those least likely to use a cellphone are persons sixty-five and older, and persons with less than $30,000 in annual income, but even large segments of those groups—74% and 84%, respectively—use cellphones.[280]

Cellphones do have disadvantages that limit their usefulness, however. Not everyone owns a cellphone, and even among those who do, not everyone has texting capabilities. Moreover, text messages are often used to send unwanted spam.[281] As a result, people may be less likely to trust notice received via text messaging. Thus, parties should only use text messaging as part of a larger notice plan that employs other forms of notice as well. In such circumstances, parties can harness the benefits of text messaging—the ability to reach a large number of people at relatively low costs—while also mitigating concerns that text messages will not reach, or will be ignored by, certain class members.

CONCLUSION

As this Comment goes to print, the Judicial Conference's Committee on Rules of Practice and Procedure ("Standing Committee") has approved the Advisory Committee on Civil Rules's recommendation to submit various proposed amendments to Rule 23 for public comment.[282] One proposed amendment is to Rule 23(c)(2)(B), governing provision of notice in (b)(3) classes. It reads:

> *For (b)(3) Classes*. For any class certified under Rule 23(b)(3)—or upon ordering notice under Rule 23(e)(1) to a class proposed to be certified for purposes of settlement under Rule 23(b)(3)—the court must direct to class members the best notice that is practicable under the circumstances, including individual notice to all members who can be identified through

276 *See Social Networking Fact Sheet*, *supra* note 262 (noting that 90% of men and 88% of women owned cellphones in 2014).

277 *See id.* (reporting that 90% of persons identifying as white, 90% of persons identifying as African-American, and 92% of persons identifying as Hispanic owned cellphones in 2014).

278 *See id.* (reporting that 84% of persons with less than $30,000 in annual income, 90% of persons with between $30,000 and $49,999 in annual income, 99% of persons with between $50,000 and $74,999 in annual income, and 98% of persons with over $75,000 in annual income owned cellphones in 2014).

279 *See id.* (reporting that 87% of persons with a high school degree or less, 93% of persons with some college, and 93% of persons with a college degree or more owned cellphones in 2014).

280 *Id.*

281 *See Mobile Technology Fact Sheet*, *supra* note 269 (reporting that sixty-nine percent of cellphone users had received unwanted spam).

282 COMM. ON THE RULES OF PRACTICE & PROCEDURE, SUMMARY OF THE REPORT OF THE JUDICIAL CONFERENCE COMMITTEE ON RULES OF PRACTICE AND PROCEDURE 22-24 (Sept. 2016), http://www.uscourts.gov/sites/default/files/st09-2016_0.pdf [https://perma.cc/EH4M-8EFY].

> reasonable effort. The notice may be by United States mail, electronic means, or other appropriate means.[283]

The Advisory Committee explained that it was recommending that the above amendment be circulated for public comment in an effort "to recognize contemporary methods of giving notice to class members" and "call attention to them," noting that "[c]ourts and counsel have begun to employ new technology to make notice more effective, and sometimes less costly."[284] It continued: "Because there is no reason to expect that technological change will halt soon, courts giving notice under this rule should consider existing technology, including class members' likely access to such technology, when selecting a method of giving notice."[285]

Given the discussion to this point, the Advisory Committee's conclusions are accurate, their motivations are appropriate, and their proposed amendment should be adopted. We live in a society that is changing due to technology. It is clear that modern technology, in many situations, may offer a better means of effectuating class notice than traditional methods of notice. Rule 23 should therefore be amended to recognize these changes, as the quoted proposal does. It not only provides a textual hook for judges seeking to utilize technology to provide notice, but also emphasizes the important role that technology can play in providing notice. Such an amendment would ideally encourage recalcitrant judges to consider new means of disseminating notice.

Moreover, the current form of the amendment is sufficiently broad to permit courts to use the various forms of electronic notice detailed in this Comment. A previous iteration of the amendment read:

> *For (b)(3) Classes*. For any class certified under Rule 23(b)(3), the court must direct to class members the best notice that is practicable under the circumstances, including individual notice by electronic or other means to all members who can be identified through reasonable effort.[286]

The problem with this proposal was its emphasis on electronic notice only when individual notice is required. The Advisory Committee's revised submission solves the problem by broadly stating that "[t]he notice," implying

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283 Memorandum from Hon. Jeffrey S. Sutton, Chair, Comm. on Rules of Practice & Procedure, to Hon. John D. Bates, Chair, Advisory Comm. on Civil Rules 2 (May 12, 2016), http://www.uscourts.gov/sites/default/files/2016-05-12-civil_rules_report_to_the_standing_committee_0.pdf [https://perma.cc/N6W7-38AV] [hereinafter Advisory Committee Memo] (emphasis omitted).

284 *Id.* at 4.

285 *Id.*

286 Memorandum from the Rule 23 Subcomm. 46 (Sept. 11, 2015), http://www.uscourts.gov/sites/default/files/rule_23_mini-conference_materials.pdf [https://perma.cc/RA5K-HV4C] (emphasis omitted).

any notice, "may be by United States mail, *electronic means*, or other *appropriate means*."[287] Such broad language certainly encompasses the various forms of electronic notice that courts and parties are already using, including email, banner and pop-up advertisements, dedicated websites, and the like. It is also sufficiently broad so as to allow parties to use new technologies not yet contemplated—a desirable outcome given rapid technological advances and uncertainty regarding future developments.

This Comment has explored class action notice in the digital age. Though many courts continue to use traditional means of communication to provide notice, others have begun to embrace the technological changes of the Twenty-First Century. But courts can go further. Technology is increasingly allowing individuals to communicate with one another instantaneously across the globe. It also permits the analysis of large amounts of data to discern patterns and better understand individuals. Courts should look to technologies such as machine learning systems, social media, and texting when considering the best means of providing notice to class members. It is the courts' job to protect the interests of class members, including ensuring that they receive adequate notice and an opportunity to be heard. To that end, the proposed change to Rule 23 is a welcome one. It recognizes the importance that technology plays in disseminating notice, and it will hopefully prompt courts to use new technologies—both those currently available and those yet to be invented.

Most important, courts and parties must approach future technologies with an open mind. After all, technology is changing rapidly and connecting the world in ways that were unimaginable just a few years ago. Although it is impossible to know what technologies the future will bring, courts and parties should be receptive to them, as the best notice practicable standard demands no less. It is flexible and adaptable to changing times; it requires courts to look to modern forms of communication to determine how best to reach people and inform them of their rights while at the same time not setting forth an unyielding rule demanding courts and parties to provide notice through specified means. Courts and parties would do well to keep this in mind and adapt to the times.

287 Advisory Committee Memo, *supra* note 283, at 4.