

OF WILD BEASTS AND DIGITAL ANALOGUES: THE LEGAL STATUS OF AUTONOMOUS SYSTEMS

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INTRODUCTION

The emerging legal issues surrounding artificial intelligence (A.I.) have become a fruitful ground for legal scholarship over the past few years. One of the hottest topics within that broader subject is the concept of “A.I. personhood.” The usual framing of the issue is: “Should we grant ‘personhood’ to A.I. systems and give them legal recognition in the same way that the law recognizes corporations and natural persons?” Given the rapid advances in A.I. over the past few years and the increasing number of tasks that automated systems are called upon to perform, this is hardly an idle question.

In fact, several legal academics in the past few years have gone one step beyond discussing whether A.I. personhood *should* exist and claim that existing laws *already* permit the practical equivalent of A.I. personhood. This article asks and answers three questions: (1) Is artificial personhood a good idea? (2) Do current laws—most notably the flexible laws governing the creation of Limited Liability Companies (LLCs)—already provide a viable path to A.I. personhood? (3) If A.I. systems are not persons, what could serve as an analogue for the legal status of A.I. systems?

This article thus proceeds in three parts. Part I explains what legal personhood means and why A.I. systems should not have it—at least, not yet. Part II concludes that courts would not construe LLC laws as permitting the creation of artificial persons, and that suggestions to the contrary are not merely incorrect, but potentially dangerous. Part III examines products liability, animal law, and agency law as potential legal analogues for digital persons. It concludes that agency law provides the most effective and flexible legal analogue for artificial systems.

I. PERSONHOOD

A. *What Is Legal Personhood?*

The concept of personality is fundamental to the conception of law in common-law jurisdictions. Our legal system does not care much about non-persons, except to the extent that they affect the legal rights and responsibilities of persons. Natural persons—that is, human beings—are the quintessential examples of legal persons. Indeed, *Black’s Law Dictionary* defines “law” in its broadest sense as “[t]he regime that orders *human* activities and relations.”¹ But while natural persons are the most familiar example of legal persons, and the ones endowed with the broadest range of legal rights and responsibilities, various forms of legal personhood have also been extended to other entities, most notably corporations and other business organizations.

The defining feature of legal persons is the ability to participate in the legal system by having the capacity to sue and be sued. *Black Law Dictionary* specif-

¹ *Law*, BLACK’S LAW DICTIONARY (10th ed. 2014) (emphasis added).

ically cites this ability to sue and be sued as the defining quality of a “legal entity,” the catch-all term for legal persons who are not human beings.² Absent the ability to sue and be sued, an entity is not a *legal* entity and therefore is not a person in the eyes of the law.³ And because such an entity is not a person, it is unable to own property, create an enforceable contract, or engage in any other act that entails (or could entail) access to the legal system. As a New York court once explained in a case involving a dissolved corporation:

Every action must have parties competent to sue and be sued, and for and against whom a judgment may be rendered. The very existence of a cause of action implies that there is some one entitled to sue and some one who may lawfully be sued, and consequently an action cannot be maintained if there is lacking either the former or the latter *A civil action can be maintained only in the name of a person in law, an entity, which the law of the forum can recognize as capable of possessing and asserting a right of action* Thus the rule has been formulated that “in all civil actions the prime requisite as to parties is that the plaintiff . . . must . . . be either a natural or artificial person”; and that an action cannot be maintained in the name of a plaintiff who is not a natural or artificial person having legal entity to sue or be used.⁴

Corporations are the most familiar class of artificial legal entities. Like natural persons, a corporation has the right to enter into contracts, own and dispose of assets, and file lawsuits, all in its own name.⁵ The other defining feature of the corporation is limited liability, which ensures that the owners of a corporation only stand to lose the amount of money, or capital, that they have invested in the corporation if it goes under.⁶ Together, these features give a corporation a legal existence that is largely separate from its creators and owners.

The underlying theory of corporate personhood is based on economic and (supposedly) social utility. Corporations were granted contract and property rights to encourage investment, reduce transaction costs, and facilitate large financial and property transactions,⁷ all of which are made easier by treating a corporation as an entity legally separate from its owners. Over time, corporations have accreted additional rights and responsibilities, which legal systems have recognized to promote other economic and social goals. Great controversy often surrounds the extension of additional legal rights to corporations, as ex-

² *Legal Entity*, BLACK’S LAW DICTIONARY (10th ed. 2014) (defining “legal entity” as “[a] body, other than a natural person, that can function legally, sue or be sued, and make decisions through agents.”).

³ *See id.*

⁴ *MacAffer v. Bos. & M.R.R.*, 273 N.Y.S. 679, 685 (N.Y. App. Div. 1934) (emphasis added) (citations omitted), *rev’d*, *MacAffer v. Bos. & M.R.R.*, 197 N.E. 328 (N.Y. 1935).

⁵ 19 C.J.S. *Corporations* § 638 (2018).

⁶ *See* 18 C.J.S. *Corporations* § 7 (2018).

⁷ *See generally* Frank H. Easterbrook & Daniel R. Fischel, *Limited Liability and the Corporation*, 52 U. CHI. L. REV. 89, 93–101 (1985) (discussing various justifications for corporate limited liability).

emplified by the polarized reactions to the Supreme Court's *Citizens United* decision.⁸

One additional observation relevant to assessments of the potential scope of artificial personhood is that a person or entity must be in active existence to have legal personality. Dead or fictitious persons and defunct entities cannot file a lawsuit, nor can anyone file suit on their behalf:

The capacity to sue exists only in persons in being, and not in those who are dead or who have not yet been born, and so cannot be brought before the court. Thus a proceeding cannot be brought in the name of a deceased plaintiff; such a proceeding is a nullity. Thus, where an association has no corporate existence either de jure or de facto, . . . it cannot do any act whatever as a legal entity. It cannot take title to real or to personal property, convey real property, maintain proceedings to condemn land, acquire rights by contract or otherwise, or incur debts or other liabilities, either in contract or in tort, unless by operation of an estoppel; nor can it sue or be sued The dissolution of a corporation implies its utter extinction and obliteration as a body capable of suing or being sued, or in whose favor obligations exist or upon which liabilities are imposed.⁹

A dissolved entity thus may have some residual legal existence for the purpose of winding up its affairs, but that is all. It would not have standing to sue to vindicate rights the entity might have had when it still was in active existence.

B. *Should A.I. Systems Have Legal Personhood?*

With this as background, does it make sense to extend some form of legal personhood to A.I. systems? In a word: no. There is a key practical distinction between A.I. systems on one hand and corporations (and other currently recognized legal entities) on the other. A corporation is a theoretical construct, something that effectively exists only on paper. A.I. systems, by contrast, actually exist in the physical world. A corporation has no ability to *do* anything without the aid of human agents to act on its behalf. An autonomous A.I. system is not subject to such inherent limitations.

The whole point of an autonomous vehicle, weapon, or electronic trading system is that they *can* do things without humans specifically impelling them to do so. That potential for greater autonomy and physical presence makes A.I. systems seem *more* human-like than corporations. On a superficial level, that might suggest that we should grant A.I. systems at least some form of person-

⁸ See Nina Totenberg, *When Did Companies Become People? Excavating the Legal Evolution*, NPR (July 28, 2014, 4:57 AM), <http://www.npr.org/2014/07/28/335288388/when-did-companies-become-people-excavating-the-legal-evolution> [https://perma.cc/2HQB-X5F5] (“Then came *Citizens United*, the Supreme Court’s 5-4 First Amendment decision in 2010 that extended to corporations for the first time full rights to spend money as they wish in candidate elections—federal, state and local. The decision reversed a century of legal understanding, unleashed a flood of campaign cash and created a crescendo of controversy that continues to build today.”).

⁹ *MacAffer*, 273 N.Y.S. at 686.

hood. If, after all, we imbue personhood on completely theoretical constructs, why should we withhold it from dynamic autonomous systems that actively interact with human beings and engage with the physical world?

The most obvious riposte to this rhetorical question is that it is precisely that potential for greater autonomy that cautions against recognizing A.I. systems as persons. The autonomy of A.I. systems and their ability to directly manipulate the physical world raise accountability concerns that far exceed the already-significant accountability concerns surrounding corporations. With a corporation, we can always reassure ourselves that humans are pulling the levers, even if the corporation is its own “person” in the eyes of the law. No such reassurance will be available if we recognize A.I.-based persons.

True, A.I. systems are already capable of making better decisions than humans in a surprisingly wide swath of endeavors, particularly in situations with high predictability and where erroneous decisions do not cause much harm.¹⁰ But decisions whose outcomes result in legal action often involve a high cost of error (such as medical negligence) or a high level of unpredictability (such as securities transactions). That means that humans should remain responsible for many—if not most—legally significant decisions.

Personhood would mean that an A.I. system would be legally responsible for its own actions. That, in turn, would severely diminish the incentive for humans to supervise A.I. systems or otherwise take responsibility for those systems’ decisions and operations. Consequently, A.I. personhood is not appropriate, and that will remain the case as long as there are legally significant decisions for which we want humans to retain ultimate responsibility.

This is consistent with the recommendation in *Ethically Aligned Design: A Vision for Prioritizing Human Wellbeing with Artificial Intelligence and Autonomous Systems (A/IS)*, which is part of an initiative launched by the Institute of Electrical and Electric Engineers (IEEE):

While conferring legal personhood on A/IS might bring some economic benefits, the technology has not yet developed to the point where it would be legally or morally appropriate to generally accord A/IS the rights and responsibilities inherent in the legal definition of personhood, as it is defined today. Therefore, even absent the consideration of any negative ramifications from personhood status, it would be unwise to accord such status to A/IS at this time. A/IS should therefore remain to be subject to the applicable regimes of property law.¹¹

¹⁰ See Vasant Dhar, *When to Trust Robots with Decisions, and When Not to*, HARV. BUS. REV. (May 17, 2016), <https://hbr.org/2016/05/when-to-trust-robots-with-decisions-and-when-not-to> [<https://perma.cc/JD5M-J2Y9>].

¹¹ INST. ELEC. & ELECS. ENG’RS, *ETHICALLY ALIGNED DESIGN: A VISION FOR PRIORITIZING HUMAN WELL-BEING WITH AUTONOMOUS AND INTELLIGENT SYSTEMS* 149 (2d. ed. 2017). Note: The author was chair of the subcommittee that drafted the “Legal Status of A/IS” portion of the *EAD* document, from which the quoted passage is drawn. The opinions expressed herein are solely the author’s and do not reflect the opinion of the IEEE or of any of the members of the subcommittee that drafted the relevant portions of the *Ethically Aligned Design* document.

Although the IEEE conclusion on personhood is on-point, its implication that A.I. should therefore simply be treated like other forms of human property is questionable. Treating A.I. in a manner analogous to consumer products or other forms of property does not properly account for the fact that, unlike all forms of property that the law recognizes today, A.I. systems are capable of making legally significant decisions. This point is discussed in greater depth in Sections III.A and III.D, *infra*.

II. DOES A.I. PERSONHOOD ALREADY EXIST?

The issue of whether A.I. personhood is a good idea takes on an entirely different tenor if A.I. personhood is already here. In two articles published in 2014 and 2015, Shawn Bayern argued that it is.¹² Specifically, Bayern claims that it is possible to create an LLC that is effectively controlled by an autonomous system if the LLC's organizers follow a series of steps:

- (1) an individual member creates a member-managed LLC, filing the appropriate paperwork with the state; (2) the individual (along, possibly, with the LLC, which is controlled by the sole member) enters into an operating agreement governing the conduct of the LLC; (3) the operating agreement specifies that the LLC will take actions as determined by an autonomous system, specifying terms or conditions as appropriate to achieve the autonomous system's legal goals; (4) the sole member withdraws from the LLC, leaving the LLC without any members. The result is potentially a perpetual LLC—a new legal person—that requires no ongoing intervention from any preexisting legal person in order to maintain its status.¹³

In arguing that these steps could actually lead to the creation of an autonomous LLC in practice *today*, Bayern's analysis focuses largely—indeed, almost exclusively—on two legal sources: New York's LLC statute and the Revised Uniform Limited Liability Company Act (RULLCA).¹⁴

The maxim that “extraordinary claims require extraordinary evidence” applies to the laws of men no less than it applies to the laws of nature. The central thesis of Bayern's articles is that it is already possible for an unsupervised artificial intelligence system to obtain legal personhood under existing law.¹⁵ To me—and, I would wager, to most lawyers and laypeople alike—that is an extraordinary claim. Historically, legal systems have only recognized (1) human beings and (2) entities endowed with “legal personhood”—that is, the ability to

¹² See Shawn Bayern, *Of Bitcoins, Independently Wealthy Software, and the Zero-Member LLC*, 108 NW. U. L. REV. 1485, 1486 (2014) [hereinafter Bayern, *Bitcoins*]; Shawn Bayern, *The Implications of Modern Business-Entity Law for the Regulation of Autonomous Systems*, 19 STAN. TECH. L. REV. 93, 94 (2015) [hereinafter Bayern, *Entity Law*].

¹³ Bayern, *Entity Law*, *supra* note 12, at 101. See also Bayern, *Bitcoins*, *supra* note 12, at 1497.

¹⁴ Bayern, *Entity Law*, *supra* note 12, at 102–03; Bayern, *Bitcoins*, *supra* note 12, at 1496–97. “Legal sources” is a more accurate term than “statutes” because RULLCA is a model law, not an enacted statute.

¹⁵ See Bayern, *Bitcoins*, *supra* note 12, at 1485.

sue, be sued, and take actions in the world that the legal system will enforce—but that are ultimately and actively controlled by human beings.¹⁶ Bayern's argument, if correct, would mean that legislatures have inadvertently created a new category of legal person—the first in history to be free of active human control.

Such a claim should be supported by a thorough and meticulous legal analysis of whatever law(s) that supposedly make such artificial personhood possible using the standards by which a court of competent jurisdiction would assess the argument if presented with it. Unfortunately, Bayern's articles—which seemingly have been accepted as reflecting legal reality by at least one prominent legal commentator¹⁷—do not engage in such an analysis before boldly claiming that A.I. personhood is, for all intents and purposes, already here.

A more rigorous statutory analysis reveals that it is unlikely that a court considering either New York's statute or RULLCA would conclude that either statutory framework permits the continued existence of an LLC once it has zero members—and certainly if that memberless LLC is free of active human management and control. Bayern's analysis zeroes in on the provisions in these statutes that set forth the circumstances under which an LLC must dissolve, entirely ignoring numerous other provisions in both New York's statute and RULLCA specifying how LLCs may or must conduct their affairs. Those provisions reveal that an LLC ceases to be an LLC once it becomes memberless and reflect a clear legislative intent that humans would retain ultimate control over LLCs' operations.

A. New York

The centerpiece of Bayern's memberless LLC argument is that the dissolution provisions in New York's LLC act permit an LLC to continue to exist even after all of its members withdraw. The provision that Bayern relies upon states that an LLC "is dissolved and its affairs shall be wound up" if:

at any time there are no members, provided that, unless otherwise provided in the operating agreement, the limited liability company is not dissolved and is not required to be wound up if, within one hundred eighty days *or such other period as is provided for in the operating agreement after the occurrence of the event*

¹⁶ The only notable exception is that animals were occasionally charged with crimes in late medieval and early modern Europe. *See generally* E.P. EVANS, THE CRIMINAL PROSECUTION AND CAPITAL PUNISHMENT OF ANIMALS (1906). Of course, this exception was limited; because animals are, as far as anyone is aware, unable to enter contracts and own property, their participation in the legal system was strictly limited to the criminal and quasi-criminal sphere. *See id.* at 4 (noting that describing actions against animals as "civil" is a misnomer because they "were not suits to recover for damages to property, but had solely a preventive or prohibitive character.").

¹⁷ *See* Lynn M. Lopucki, *Algorithmic Entities*, 95 WASH. U. L. REV. 887, 890 (2018) ("In two recent articles, Professor Shawn Bayern demonstrated that anyone can confer legal personhood on an autonomous computer algorithm merely by putting it in control of a limited liability company.").

*that terminated the continued membership of the last remaining member, the legal representative of the last remaining member agrees in writing to continue the limited liability company and to the admission of the legal representative of such member or its assignee to the limited liability company as a member, effective as of the occurrence of the event that terminated the continued membership of the last remaining member . . .*¹⁸

Bayern seizes upon the italicized statutory language—which is the only provision in the entire 115-section New York LLC statute that Bayern’s article cites—to argue that an LLC’s members could enter into an operating agreement setting a period of one million years before the legal representative of the last member must agree in writing to continue the LLC.¹⁹ During those million years, Bayern argues, the LLC could continue operating as an effective legal entity, with an A.I. system pulling all the levers pursuant to a carefully drafted operating agreement.²⁰

Bayern’s interpretation is plausible if one reads the text of § 701(a)(4) in isolation. But in New York, as in all jurisdictions, courts construe a statute as a whole, examining each section with reference to other sections, rather than examining only particular provisions.²¹ In New York, this principle is itself codified in a statute that provides: “Generally, it is immaterial in the construction of a statute that it is divided into sections, chapters, or titles, and all sections of a law must be read together to determine its fair meaning.”²² The overarching goal is to discern legislative intent, which requires examining the spirit and purpose of legislation as well as the text, context, and legislative history of the statute.²³

Here, based both on the language and structure of § 701(a)(4) itself and on the content of other provisions in the same statute, a New York court likely would reject Bayern’s assertion that it is possible to create an A.I.-controlled memberless LLC under New York Law. Various provisions in New York’s LLC act indicate that a member-managed LLC must have at least one member and thus ceases to exist once it loses its last member and/or demand that an LLC be managed by one or more members or managers.²⁴ And under the statute, both managers and members must be “person[s].”²⁵

The better construction would be to interpret § 701(a)(4) not as containing a loophole allowing the indefinite existence of memberless LLCs, but rather as a “safe harbor” or “cure” provision. Specifically, it is best construed as applying to cases in which the sole member of a single-member LLC dies (or, in the

¹⁸ N.Y. LTD. LIAB. CO. LAW § 701(a)(4) (McKinney 2018) (emphasis added).

¹⁹ Bayern, *Entity Law*, *supra* note 12, at 103.

²⁰ *Id.*

²¹ Albany Law Sch. v. N.Y. State Office of Mental Retardation & Developmental Disabilities, 968 N.E.2d 967, 974 (N.Y. 2012).

²² N.Y. STAT. LAW § 130 (McKinney 2018).

²³ Nostrom v. A.W. Chesterton Co., 940 N.E.2d 551, 554 (N.Y. 2010).

²⁴ See *infra* notes 25–36 and accompanying text.

²⁵ N.Y. LTD. LIAB. CO. LAW § 102(p)–(q) (McKinney 2018).

case of a corporate member, dissolves), and makes no provision for the disposition of the member's interest in the LLC. Section 701(a)(4)'s reference to the "legal representative" of a member (rather than to the member himself/herself/itself) is particularly significant in this regard because a preceding section of the LLC act (§ 608) covers situations where an LLC member dies or dissolves without making arrangements to transfer or otherwise dispose of the member's LLC interest.²⁶ By far the most plausible reading of § 701(a)(4) is as a safe harbor that provides the executor, heir, or successor of the last remaining member with an opportunity to "cure" the dissolution of the LLC by transferring the deceased or defunct member's interest to a new member.

1. LLC Members and Managers Must be Persons

Section 102(m) of New York's LLC law defines a "limited liability company" as "an unincorporated organization of one or more persons having limited liability for the contractual obligations and other liabilities of the business . . ."²⁷ The statute defines "person," in turn, as a natural person, corporation, or other legal entity.²⁸ LLCs must be managed either by its members or by member-appointed managers.²⁹ Both members and managers must be "person[s]."³⁰ It does not take strong powers of deduction to conclude that these persons who are empowered to own and manage the LLC are the "persons" whose association defines an LLC.³¹

The statute provides no escape route through which an LLC can legally operate without any members or managers. Unless the articles of organization expressly provide for manager management, "management of the limited liability company shall be vested in its members who shall manage the limited liability company in accordance with this chapter . . ."³² And if the articles call for manager management, then management "shall be vested in one or more managers" who "shall manage the limited liability company by the affirmative vote of a majority of the managers."³³ The managers or member-managers owe the LLC

²⁶ *Id.* § 608.

²⁷ *Id.* § 102(m) (emphasis added).

²⁸ *Id.* § 102(w) ("'Person' means any association, corporation, joint stock company, estate, general partnership (including any registered limited liability partnership or foreign limited liability partnership), limited association, limited liability company (including a professional service limited liability company), foreign limited liability company (including a foreign professional service limited liability company), joint venture, limited partnership, natural person, real estate investment trust, business trust or other trust, custodian, nominee or any other individual or entity in its own or any representative capacity.").

²⁹ *Id.* § 401(a). *See also id.* § 408.

³⁰ *Id.* § 102(p)–(q).

³¹ *See id.* §§ 102(q)–(r) (defining "member" and "membership interest"); *id.* § 401 (requiring LLCs to be managed by its members unless the LLC is manager-managed); *id.* § 408 (describing powers and responsibilities of managers in manager-managed LLCs).

³² *Id.* § 401(a) (emphasis added).

³³ *Id.* § 408(a)–(b) (emphasis added).

fiduciary duties of loyalty and care in exercising their management responsibilities.³⁴ Unlike many other provisions in the statute, those duties cannot be altered by the operating agreement.³⁵ Likewise, there are no provisions permitting operating agreements to modify the requirement that either managers or members actually manage the LLC.³⁶

For these reasons, during the million-year period of memberless operation suggested by Bayern's hypothetical, any remnant of the LLC *wouldn't be a LLC*. An erstwhile member-managed LLC that loses its last member no longer meets the definition of an LLC and could not satisfy the fundamental statutory requirements governing how LLCs must be managed. There might not yet be articles of dissolution or other documents showing that the LLC had dissolved but, nevertheless, a "zero-member LLC" would no longer be a legal entity in any practical sense.

*A.B. Medical Services, PLLC v. Travelers Indemnity Co.*³⁷ illustrates this point. The *A.B. Med. Servs.* case involved a Professional Limited Liability Company, which is, in essence, a regular LLC with the additional requirement that the LLC's member(s) must be practicing physicians, attorneys, or other specified professionals.³⁸ The LLC at issue in *A.B. Med. Servs.* was a medical practice that had one physician-member.³⁹ That physician-member's medical license was suspended, and losing his status as a practicing physician meant that he could no longer legally be a member of the LLC.⁴⁰ The court explained the impact of this event:

Once his medical license was suspended, he became legally disqualified from practicing medicine within the state and was disqualified from continuing as a member of plaintiff (*see* Limited Liability Company Law § 1209). *Dissolution occurred on the effective date of the suspension of Dr. Braver's medical license since, at that point, there were no remaining members of the professional service limited liability company (see* Limited Liability Company Law § 701[a][4] [a "limited liability company is dissolved and its affairs shall be wound up . . . at any time there are no members"]). We note that although articles of dissolution

³⁴ *See id.* § 409; O'Connell v. Shallo (*In re* Die Fliedermaus LLC), 323 B.R. 101, 110 (Bankr. S.D.N.Y. 2005) (citing § 409).

³⁵ *See* N.Y. LTD. LIAB. CO. LAW § 409(a).

³⁶ In what was likely a legislative Freudian slip, § 409(a) states that each manager (including members acting as managers, *see id.* § 401(a)) "shall perform *his or her* duties . . . in good faith and with that degree of care that an ordinarily prudent person in a like position would use under similar circumstances." *Id.* § 409(a) (emphasis added). The same section allows a manager to rely on information provided by certain other persons "[i]n performing *his or her* duties." *Id.* (emphasis added). While the statutory definition of "manager" states that any "person" (a term that includes entities) may serve as manager, the use of gendered pronouns is a powerful—if not inescapable—signal that the legislature intended natural persons to exercise ultimate control over LLCs.

³⁷ *A.B. Med. Servs., PLLC v. Travelers Indem. Co.*, 895 N.Y.S.2d 759 (N.Y. App. Term 2009) [hereinafter *A.B. Med. Servs. I*].

³⁸ *Id.*; *see* N.Y. LTD. LIAB. CO. LAW §§ 1201(b)–(d), 1203(a) (McKinney 2018).

³⁹ *A.B. Med. Servs. I*, 895 N.Y.S.2d at 760.

⁴⁰ *Id.* at 761; *see* N.Y. LTD. LIAB. CO. LAW § 1209 (McKinney 2018).

have now been filed, *there is no statutory requirement that articles of dissolution be filed before commencement of the winding up process.*⁴¹

The trial court in *A.B. Medical Services* had reached the same conclusion, stating that “[t]he entity since it is without members *and since it has not taken steps to transfer ownership to a qualified member*, must dissolve and wind up its affairs in accordance with Article VII of the Limited Liability Company Law.”⁴² In other words, because the LLC had no active members and had no active plan to bring in a new member, the LLC had dissolved.

True, there is no indication that the operating agreement of the LLC in *A.B. Med. Servs.* had Bayern’s hypothetical “million-year” provision. But that is beside the point. The court’s reasoning suggests that the period after the disassociation of the last member is a period during which someone can *cure* the LLC’s dissolution by making arrangements to introduce a new member, not a period during which the memberless LLC can continue conducting business as usual without making any such arrangements. That conclusion is consistent with the grammatical structure of § 701(a)(4), under which the dissolution is effective as of the date the last member disassociates “*unless*” the necessary steps are taken to ensure the LLC’s continued existence.⁴³ Thus, whether the period before the dissolution is finalized runs for a day, a month, or a million years is ultimately immaterial; unless arrangements to add a new member are in place, a New York court faced with a memberless LLC during that period would conclude that the LLC had already dissolved.

2. *The Limitations on Operating Agreements Under New York Law*

Bayern’s “memberless LLC” concept is also premised on his assertion that an operating agreement can be used to override any provision in an LLC statute.⁴⁴ That logic fails to account for the fact that under the express terms of New York’s LLC law, operating agreements *cannot* be used to override provisions in articles of organization or the LLC act itself.⁴⁵ Unlike RULLCA, which treats most of its rules as mere default rules that can be dispensed with by a company’s operating agreement, New York’s statute expressly states that an

⁴¹ *A.B. Med. Servs. I*, 895 N.Y.S.2d at 761 (emphasis added).

⁴² *A.B. Med. Servs. PLLC v. Travelers Indem. Co.*, 858 N.Y.S.2d 574, 578 (N.Y. Dist. Ct. 2008) [hereinafter *A.B. Med. Servs. II*] (emphasis added). The appellate court reversed the district court’s decision on other grounds, namely that the dissolution of the LLC did not warrant a stay in proceedings. See *A.B. Med. Servs. I*, N.Y.S.2d at 761.

⁴³ See N.Y. LTD. LIAB. CO. LAW § 701(a)(4) (McKinney 2018) (emphasis added); see also *id.* at § 211(d)(4) (requiring an LLC to file amended articles of organization within 90 days of an event that would trigger dissolution if the LLC wishes to continue its operations).

⁴⁴ See Bayern, *Entity Law*, *supra* note 12, at 104 (claiming that the range of action of an A.I.-controlled LLC extends to “anything a contract or operating agreement can specify as a term or condition.”).

⁴⁵ See N.Y. LTD. LIAB. CO. LAW § 202(j) (McKinney 2018).

LLC can “make and alter its operating agreement, *not inconsistent with its articles of organization or with the laws of this state . . .*”⁴⁶

Granted, many provisions describing the particulars of LLC management and membership include an explicit “except as provided in the operating agreement” caveat.⁴⁷ But many key provisions—including the definitions of “LLC,” “manager,” “member,” and “person”⁴⁸; the necessity of management by managers or members⁴⁹; and the powers of a deceased member’s estate⁵⁰—contain no such carve-out. The LLC laws of New York are not, therefore, merely default rules that an LLC can override through an operating agreement. A clever LLC organizer cannot “contract around” the rules that preclude the existence of memberless LLCs.

3. Purpose of the LLC Statute

Bayern suggests that LLC statutes “emphasize[] the freedom of those involved in the organization to determine its internal structure and . . . permit[] forms of governance much more flexible than those in traditional partnerships or corporations,” implying that states created the LLC precisely so that company organizers could choose a form of organization that provides maximum flexibility.⁵¹ While this notion seems to have gained a certain quality of conventional wisdom during the four decades since Wyoming adopted the first LLC statute, the conception of a LLC as a uniquely flexible “creature of contract” is often overstated.⁵² Relevant here, New York courts have noted that “the purpose of the Limited Liability Company Law was to encourage business and commerce by allowing for formation of a new type of business entity—one that combined a corporation’s limitations on personal liability *with the operating flexibility of a partnership . . .*”⁵³

⁴⁶ *Id.* (emphasis added); *see also id.* § 417(a) (operating agreement can “contain[] any provisions *not inconsistent with law or its articles of organization* relating to (i) the business of the limited liability company, (ii) the conduct of its affairs and (iii) the rights, powers, preferences, limitations or responsibilities of its members, managers, employees or agents, as the case may be.”) (emphasis added).

⁴⁷ *E.g.*, N.Y. LTD. LIAB. CO. LAW § 408(b) (McKinney 2018) (“Except as provided in the operating agreement and in accordance with section four hundred nineteen of this article, the managers shall manage the limited liability company by the affirmative vote of a majority of the managers.”).

⁴⁸ *See supra* Section II.A.1.

⁴⁹ *See supra* Section II.A.1.

⁵⁰ *See infra* Section II.A.4.

⁵¹ Bayern, *Entity Law*, *supra* note 12, at 95.

⁵² *See generally* Mohsen Manesh, *Creatures of Contract: A Half-Truth About LLCs*, 42 DEL. J. CORP. L. 391 (2018). Indeed, courts in some states appear to reject the conception of LLCs as fundamentally “creatures of contract” altogether, instead describing them as “creature[s] of statute.” *See Harbison v. Strickland*, 900 So.2d 385, 389 (Ala. 2004); *Patmon v. Hobbs*, 280 S.W.3d 589, 593 (Ky. Ct. App. 2009).

⁵³ *Barklee Realty Co. v. Pataki*, 765 N.Y.S.2d 599, 604 (N.Y. App. Div. 2003) (emphasis added). *See also Landa v. Herman*, No. 105360/03, 2005 WL 2899876, at *1 (N.Y. Sup. Ct.

The legislative intent to provide LLCs with “flexibility” thus does not extend as far as Bayern suggests. Instead, LLCs are intended to have roughly the same flexibility in managing their internal affairs that a partnership would have. Partnerships cannot exist with zero partners.⁵⁴ Like single-shareholder corporations, an LLC can exist with a single member,⁵⁵ whereas a partnership requires an association of at least *two* persons as partners.⁵⁶ But neither partnerships nor corporations can exist with *zero* partners or shareholders under New York law.

4. Section 608 and the Real Meaning of § 701(a)(4)

Section 701(a)(4) refers to the “*legal representative of the last remaining member*”⁵⁷ rather than just to “the last remaining member.” The “legal representative” of a member’s is also referenced in § 608, which describes the rights and obligations of a “legal representative” of (1) a human LLC member who “dies or a court of competent jurisdiction adjudges him or her to be incompetent”; and (2) an LLC member that is a non-human legal entity that “is dissolved or terminated.”⁵⁸ In such a case, § 608 empowers the member’s executor, guardian, or other legal representative to exercise the member’s rights in the LLC.⁵⁹

A court would read § 701(a)(4) in light of § 608, which is part of the same statute, contains many of the same key terms, and covers a similar set of circumstances (i.e., what happens when an LLC loses a member). Section 608 strongly suggests that § 701(a)(4) is a “safe harbor” for cases in which the sole remaining member of an LLC dies (or dissolves, in the case of a business entity) or becomes legally incapacitated without leaving clear instructions regarding what should happen to the member’s interest in the LLC. This makes sense because it is only under those circumstances that the statute would need to contemplate action by the “legal representative” of the last remaining member rather than by the last remaining member himself, herself, or itself.

Oct. 27, 2005) (“An LLC combines the corporate limitation on personal liability of the owners (who are called ‘members’) with the partnership’s operating and management flexibility by its members (which would be ‘member-managed’) or by persons selected by its members (which would be ‘manager-managed’)”) (internal quotation marks omitted). New York courts are hardly alone in analogizing LLCs to partnerships, albeit with corporation-like limited liability. In Delaware, the most influential state in terms of business organization law, courts have often looked to case law involving limited partnerships when analogous legal questions arise in the context of LLCs. *See* Manesh, *supra* note 52, at 425–26.

⁵⁴ N.Y. P’SHP LAW § 10 (McKinney 2018) (“A partnership is an association of two or more persons . . .”).

⁵⁵ N.Y. LTD. LIAB. CO. LAW § 102(m) (McKinney 2018) (defining an LLC as “an unincorporated organization of one or more persons . . .”).

⁵⁶ N.Y. P’SHP LAW § 10 (McKinney 2018) (“A partnership is an association of two or more persons . . .”).

⁵⁷ N.Y. LTD. LIAB. CO. LAW § 701(a)(4) (McKinney 2018).

⁵⁸ *Id.* § 608.

⁵⁹ *Id.*

The language of § 701(a)(4) thus, in reality, does no more than recognize that a member's heir or successor may have an interest in continuing an LLC that otherwise would dissolve. There is no indication that the provision was meant to allow the last remaining member of an LLC to voluntarily resign while permitting the LLC itself to continue operating, and it is very unlikely that a court facing such a scenario would read the statute that way.

5. Conclusion

New York's LLC law includes other provisions outside those listed above that would be impossible to fulfill or would make no sense if an LLC had no members. For instance, an LLC must maintain a current list of all members and managers.⁶⁰ And the provisions relating to management of an LLC operate—sometimes explicitly—on the presumption that the LLC has at least one member.⁶¹

It is difficult to conceive how an LLC could comply with the numerous requirements set forth in New York's LLC law without any active members, which suggests that the legislature did not intend to allow memberless LLCs to exist. Bayern, focusing on only § 701(a)(4), interprets the statute differently. In cases where a statute is susceptible to more than one reasonable interpretation, the court will choose the construction that harmonizes any seemingly conflicting provisions in light of the apparent legislative intent behind the statute as a whole.⁶² In so doing, New York courts, like all courts:

- avoid constructions that lead to absurd results;⁶³
- avoid constructions that are unreasonable or would undercut the purpose behind a statutory provision;⁶⁴ and
- recognize that legislatures expect courts to use common sense when interpreting a statute.⁶⁵

⁶⁰ *Id.* § 1102(a)(1)–(2).

⁶¹ *E.g.*, *id.* §§ 401(a) (LLC presumed to be managed by all members unless the LLC's articles of organization or operating agreement contains provisions “granting or withholding the management powers or responsibilities of one or more members or classes of members”) (emphasis added), 402(c) (requiring majority votes of members for certain legally significant acts, regardless of whether LLC is member- or manager-managed).

⁶² *E.g.*, *Ador Realty, LLC v. Div. of Hous. & Cmty. Renewal*, 802 N.Y.S.2d 190, 196 (N.Y. App. Div. 2005) (“The rules of statutory construction . . . require that, where it is possible to do so, the various parts of the statutory scheme be harmonized, reading and construing them together and reconciling the apparently conflicting provisions in the manner most consistent with the overall legislative intent.”) (citations omitted).

⁶³ *In re Fay*, 52 N.E.2d 97, 103 (N.Y. 1943) (“In the construction of a statutory or constitutional provision a meaning should not be given to words that are the subject of construction that will defeat the purpose and intent of the statutory provision or that will make such provision absurd.”).

⁶⁴ *Id.*; *City of Buffalo v. Maggio*, 275 N.Y.S.2d 698, 701 (N.Y. App. Div. 1966) (“[A]n unreasonable construction, contrary to the general statutory policies and standards of the state, should not be adopted in the absence of a definite intent, clearly and unmistakably expressed.”).

Here, a construction of § 701(a)(4) that would permit an LLC to set a million-year safe harbor period would plainly undercut the purpose of the provision, which is to ensure that LLCs dissolve if they become memberless. It also would, frankly, be an unreasonable and absurd result given the numerous provisions in the statute whose practical vitality depends on the LLC having at least one member. Courts tend to avoid such constructions even if they *are* consistent with a statute's plain language.⁶⁶ Here, because Bayern's interpretation of § 701(a)(4) would be patently inconsistent with the plain language of many provisions in New York's LLC law, there is little to commend a hyper-technical and contextually divorced reading of § 701(a)(4) that interprets it as permitting the continued existence of an LLC that loses its last member.

Reading § 701(a)(4) in isolation, Bayern's interpretation of New York law makes some sense. But viewed in the broader context of the statute as a whole, which is how courts construe statutes, it is plain that a memberless LLC inhabited by an A.I. system could not exist as an effective legal entity for a million years—or even one day—under New York law.

B. *The Revised Uniform Limited Liability Company Act (RULLCA)*

RULLCA does not rescue Bayern's argument that a memberless, A.I.-directed LLC could have legal vitality. At the outset, it is important to remember that "uniform laws" like RULLCA are not actually laws. Rather, they are blueprints for laws prepared by legal scholars and practitioners. States can adopt, adapt, or ignore uniform laws. In the case of RULLCA, the majority of states have gone with the "ignore" option.

The Uniform Law Commission's (ULC's) website includes a map showing eighteen states that, according to the ULC, have adopted RULLCA.⁶⁷ Bayern's articles imply that these RULLCA-adopting states did so without making any substantial changes.⁶⁸ That is not correct. An examination of actual enacted statutes from the states that have "adopted" RULLCA reveals that each state

⁶⁵ *Chatsworth 72nd St. Corp. v. Rigai*, 336 N.Y.S.2d 604, 612 (N.Y. Civ. Ct. 1972) ("[T]he ordinary rules of common sense . . . are integrated into every issue of statutory construction."). See also *Bond v. United States*, 572 U.S. 844, 857 (2014) ("Part of a fair reading of statutory text is recognizing that 'Congress legislates against the backdrop' of certain unexpressed presumptions The notion that some things 'go without saying' applies to legislation just as it does to everyday life.").

⁶⁶ *E.g.*, *United States v. Arnold*, 126 F.3d 82, 89 (2d Cir. 1997) ("A statute should not be literally applied if it results in an interpretation clearly at odds with the intent of the drafters. While the Court cannot and should not rewrite a poorly drafted statute, it has an obligation to interpret a statute so as to give it reasonable meaning.").

⁶⁷ The Nat'l Conference of Comm'rs on Unif. State Laws, *Acts: Limited Liability Company (2006) (last amended 2013)*, UNIFORM LAW COMMISSION, [http://www.uniformlaws.org/Act.aspx?title=Limited%20Liability%20Company%20\(2006\)%20\(Last%20Amended%202013\)](http://www.uniformlaws.org/Act.aspx?title=Limited%20Liability%20Company%20(2006)%20(Last%20Amended%202013)) [<https://perma.cc/BD56-4N9V>] (last visited Sept. 17, 2018).

⁶⁸ See Bayern, *Bitcoins*, *supra* note 12, at 1497 n.40 (citing to the Uniform Law Commission's webpage for RULLCA).

made modifications—and some made significant modifications—to at least some substantive provisions from the model law.⁶⁹

But even if one were to treat RULLCA as if it is, in fact, an actual statute, and examine its text in the manner of a typical American court engaging in statutory construction, it still is unlikely that a court would construe RULLCA as permitting the creation of a memberless LLC run by an unsupervised A.I. An examination of state statutes based on RULLCA only reinforces that conclusion.

1. *The Text of RULLCA*

Like New York, RULLCA allows only “members” and “managers” to manage an LLC,⁷⁰ and both members and managers must, by express definition, be “persons.”⁷¹ A member-managed LLC without any members thus would be unable to operate in compliance with RULLCA.

Under the express terms of RULLCA, the longest an LLC can arguably survive with zero members is 90 days:

- (a) A limited liability company is dissolved, and its activities and affairs must be wound up, upon . . .
- (3) the passage of 90 consecutive days during which the company has no members unless before the end of the period:
 - (A) consent to admit at least one specified person as a member is given by transferees owning the rights to receive a majority of distributions as transferees at the time the consent is to be effective; and
 - (B) at least one person becomes a member in accordance with the consent[.]⁷²

Bayern attempts to dismiss the significance of this limitation by suggesting that a state could adopt RULLCA without it.⁷³ But his articles fail to identify a single state that actually has done so.

In any event, even construing § 701(a)(3) as permitting a 90-day period of memberless active existence hinges on courts adopting a maximalist reading of that provision. As indicated by the *A.B. Medical Services*⁷⁴ case construing the similarly worded New York provision, a court faced with construing § 701(a)(3) likely would hold that the dissolution occurred at the time that the

⁶⁹ See *infra* Section II.B.2.

⁷⁰ UNIF. LTD. LIAB. CO. ACT § 102(12) (UNIF. LAW COMM’N 2006) (amended 2013) (defining a “member-managed” LLC as an LLC that “is not . . . manager-managed”). Unless otherwise stated, all citations to RULLCA are to the version of RULLCA as it appeared after the most recent series of amendments in 2013. Document available at http://www.uniformlaws.org/shared/docs/limited%20liability%20company/ULLCA_Final_2014_2015aug19.pdf [<https://perma.cc/2JQW-TQKS>] (last visited Sept. 24, 2018).

⁷¹ *Id.* § 102(9), (11).

⁷² *Id.* § 701.

⁷³ Bayern, *Bitcoins*, *supra* note 12, at 1496–97.

⁷⁴ *A.B. Med. Servs. PLLC v. Travelers Indem. Co.*, 858 N.Y.S.2d 574, 578 (N.Y.S.2d 2008) (“*A.B. Med. Servs. P.*”).

last member withdrew.⁷⁵ As with New York's provision, the 90-day window is best viewed as a period for cure rather than a period of active existence. Indeed, that is how the 1996 version of RULLCA structured the predecessor to the current 90-day automatic dissolution rule.⁷⁶

This construction is consistent with the structure of both § 701(a)(3) itself and with § 401(c)(4), which permits a person to be appointed as a member “as provided in Section 701(a)(3).”⁷⁷ A “cure period” interpretation of the 90-day window is further reinforced by §§ 702(c)–(d), which, like § 608 of New York's statute, permits the “legal representative of the last person to have been a member” to wind up the LLC's affairs.⁷⁸

One could argue that the 90-day provision is merely a default rule that is subject to modification by an LLC's operating agreement. Indeed, the ULC's comments on § 701 in the “harmonized” version of RULLCA state that § 701(a)(3), unlike the two subparagraphs that follow it, is a default rule.⁷⁹ But it does not follow from this that the organizers of a LLC can contract their way around the requirement that the entity be managed by a person—that is, a manager or member.

Moreover, it is not necessarily apropos of anything that the drafters of RULLCA neglected to include an explicit provision stating that a LLC must have at least one member. Even under RULLCA's admittedly hyper-flexible framework for LLCs, numerous provisions clearly state or presume that an LLC will have at least one member and be run by members or managers. Section 102(13), for instance, defines an operating agreement, in part, as “the agreement . . . of all the members of a limited liability company, including a sole member.”⁸⁰ Section 105(a)(1) similarly states that an operating agreement governs “relations among the members as members and between the members

⁷⁵ See *supra* Section II.A.1.

⁷⁶ See UNIF. LTD. LIAB. CO. ACT § 801(3) (NAT'L CONF. OF COMM'RS ON UNIF. STATE LAWS 1996) [hereinafter “ULLCA”] (requiring dissolution upon the occurrence of “an event that makes it unlawful for all or substantially all of the business of the company to be continued, but any cure of illegality within 90 days after notice to the company of the event is effective retroactively to the date of the event for purposes of this section”). Because the preface to RULLCA did not list the dissolution provisions in its description of the noteworthy changes RULLCA made to ULLCA, there is no reason to believe that the modifications to § 701 were intended to alter the “period for cure” nature of this provision. See UNIF. LTD. LIAB. CO. ACT, Prefatory Note (UNIF LAW COMM'N 2006) (amended 2013).

⁷⁷ UNIF. LTD. LIAB. CO. ACT § 401(c)(4) (UNIF LAW COMM'N 2006) (amended 2013). The version of § 401(d)(4) that appeared in the 2006 version of RULLCA restated the rule from § 701(a)(3) explicitly, providing that the legal representative of the last surviving member could appoint a new member, but only if the designee consents to become a member “within 90 consecutive days after the company ceases to have any members.” UNIF. LTD. LIAB. CO. ACT § 401(d)(4), 7 U.L.A. (2006).

⁷⁸ UNIF. LTD. LIAB. CO. ACT § 702(c)–(d) (UNIF LAW COMM'N 2006) (amended 2013); N.Y. LTD. LIAB. CO. LAW § 608 (McKinney 2018).

⁷⁹ UNIF. LTD. LIAB. CO. ACT § 701 comments (UNIF LAW COMM'N 2006) (amended 2013).

⁸⁰ *Id.* § 102.

and the limited liability company.”⁸¹ Section 108(a) specifies that “[a] limited liability company is an entity distinct from its member or members.”⁸² And so on.

Courts recognize that “some things ‘go without saying’” in legislation just as in everyday life, and legislatures thus always legislate “‘against the backdrop’ of certain unexpressed presumptions.”⁸³ The idea that an LLC must have at least one member is precisely such an unexpressed presumption. The principle that an artificial legal entity must have at least one owner, shareholder, or member is sufficiently engrained, both in the text of RULLCA and in the legal milieu more generally, that there is no real need to spell it out.

More broadly, it is not surprising that legislatures did not include provisions in their statutes explicitly requiring that a business organization be, at its base, under the control of humans (or of an entity controlled by humans, or an entity controlled by an entity controlled by humans). Even today, with all the advances in machine learning that have taken place in the past decade, the concept of a sophisticated AI system capable of carrying out the multifaceted tasks necessary to manage a business organization without direct and continuous human supervision lies more than in the realm of theory than imminent technological reality. Certainly, twentieth-century legislatures had no reason to anticipate and thus no need to legislate for a world in which an ostensible LLC could engage in substantial activity without human supervision.

For these reasons, there was never any pressing need to have a specific provision explicitly declaring that an LLC must have at least one member, or that an LLC therefore must dissolve once it has no remaining members. It is highly unlikely that a court would conclude that a statute tracking RULLCA permits the existence of an LLC with zero members under the control of an A.I. system.

2. *Enacted Statutes Based on RULLCA*

As previously noted, RULLCA is not a law in and of itself. It is instead a “model law” that states can adopt or adapt. According to the Uniform Law Commission, eighteen states plus the District of Columbia have adopted RULLCA in some form as of 2018.⁸⁴ The author examined the statutes in seven

⁸¹ *Id.* § 105(a)(1).

⁸² *Id.* § 108(a).

⁸³ *Bond v. United States*, 572 U.S. 844, 857 (2014). A similar principle has been expressed by courts construing contracts. *See, e.g., Dieckman v. Regency GP LP*, 155 A.3d 358, 368 (Del. 2017) (holding that the absence of express contractual terms “are easily implied because ‘the parties must have intended them and have only failed to express them because they are too obvious to need expression.’ Stated another way, ‘some aspects of the deal are so obvious to the participants that they never think, or see no need, to address them.’”) (citations omitted).

⁸⁴ The Nat’l Conference of Comm’rs on Unif. State Laws, *Limited Liability Company (2006) Last Amended 2013*, UNIFORM LAW COMMISSION, <http://www.uniformlaws.org/Act.a>

of those states: the five largest RULLCA states (California, Florida, Illinois, Pennsylvania, and Washington) plus South Dakota and Wyoming, which punch above their proverbial weight as forums for the formation of companies due to their favorable taxation and corporate secrecy laws.⁸⁵

Each of those seven states has the three features listed in the above analysis of RULLCA that make it unlikely that a court would recognize a “memberless LLC” as a legal entity. That is:

- Each state requires an LLC to be member- or manager-managed, and requires both “members” and “managers” to be persons;⁸⁶ and
- Each state has a provision that an LLC automatically dissolves 90 days (180 days in Pennsylvania) after the death or departure of its last member.⁸⁷

Various other provisions in adopting states’ statutes necessarily assume or imply that an LLC must have at least one member. Indeed, most of the RULLCA states have additional provisions above and beyond those appearing in RULLCA that preclude the possibility of memberless LLCs.⁸⁸

C. Conclusion

One may reasonably question why Bayern’s articles and the ideas espoused therein merit seven thousand words of refutation. The answer is twofold. First, many people read law review articles as a source of legal information, particularly in emerging and uncertain areas of law. If the information in a law review article is inaccurate or incomplete, a reader will end up with a skewed idea of what the law is. That danger is particularly acute if the reader is someone without legal training. Here, there is scant case law discussing the possibility of a zero-member LLC, and no case law discussing A.I. personhood. Consequently, if a person wishes to know whether it is possible to create an autonomous A.I.

spx?title=Limited%20Liability%20Company%20(2006)%20(Last%20Amended%202013) [https://perma.cc/BD56-4N9V] (last visited Sept. 17, 2018).

⁸⁵ See, e.g., J. Weston Phippen, *Nevada, a Tax Haven for Only \$174*, ATLANTIC (Apr. 6, 2016), <https://www.theatlantic.com/national/archive/2016/04/panama-papers-nevada/476994/> [https://perma.cc/5VWR-B7SC] (listing South Dakota and Wyoming along with Delaware and Nevada as popular states for incorporation due to tax benefits and a high level of permitted corporate secrecy).

⁸⁶ FLA. STAT. § 605.0102(38)–(41) (2018); WASH. REV. CODE §§ 25.15.006(8)–(11), 25.15.151(1)(a), 25.15.154(1)(a) (2018); WYO. STAT. ANN. §§ 17-29-102(a)(x)–(xiii), 17-29-407(a)(i)(A)–(C), (c)(i) (2018).

⁸⁷ Illinois and South Dakota are still operating under variations of the 1996 version of RULLCA, under which an LLC automatically dissolves upon the occurrence of any event that makes it impossible for the LLC to be operated lawfully—which would include having no members or managers, since such an LLC could not be managed in accordance with the law—unless the illegality is cured within 90 days. See UNIF. LTD. LIAB. CO. ACT § 801 (NAT’L CONFERENCE OF COMM’RS ON UNIF. STATE LAWS 1996).

⁸⁸ Matt Scherer, *Is AI Personhood Already Possible Under U.S. LLC Laws? (Part Three)*, LAW & AI (June 18, 2017), <http://www.lawandai.com/2017/06/18/is-ai-personhood-already-possible-under-u-s-llc-laws-part-three/> [https://perma.cc/6HWR-TKUA].

system and have the law treat it like a person, Bayern's articles and those citing it would very likely be among the first things they would come across.

That leads to the second, deeper reason that Bayern's proposal matters: if some misguided entrepreneur actually attempted to put Bayern's framework into practice, they would actually be creating a situation where, regardless of whether Bayern is correct or incorrect, victims likely would be unable to obtain compensation if the ostensible "memberless LLC" causes harm.

Part I's discussion on the definition of legal personhood explains why a dissolved entity loses the capacity to sue. That may seem to be a good thing if a court were faced with a "memberless LLC," since that lack of capacity would limit the erstwhile LLC's ability to take legally meaningful actions. But there is a dark flip side to a dissolved entity's inability to sue to enforce its rights—namely, that others cannot sue that entity to enforce *their* rights. Ordinarily, when someone is injured or their rights are violated, that person can sue whoever caused the injury and seek compensation or some other form of redress. This option is not available if the injury was caused by something that is not a legal person and therefore lacks the capacity to be sued. The well-known legal maxim "for every wrong, the law provides a remedy" does not hold true for harms caused by non-persons.

This means that a "memberless LLC" could be effectively immune from suit for events that occurred after the withdrawal of the last member. Injuries caused by the system would be like injuries caused by a wild animal. Because animals are not legal persons, victims of animal attacks have no legal remedy unless they can identify a legal person who can be held legally responsible for the animal's conduct. With respect to wild animals, who are not owned or possessed by any person or entity, the lack of animal personhood means that no one can be held legally responsible for harms they cause.

With that in mind, let us imagine for a moment what might happen if a person decided, whether for business reasons or out of curiosity, to create an A.I. system that has personhood. Following Bayern's framework, the person sets up a single-member LLC under member management, creates an operating agreement placing the LLC under the control of an A.I. system, withdraws as a member, and assumes that they have created a legal person. Relying on Bayern's reasoning, the organizer of the A.I.-controlled LLC would believe that the LLC is a real legal entity and that, as a result, the organizer is not legally responsible for the A.I. system's operations through the LLC.

Regardless of whether Bayern's analysis is right or wrong, the resulting situation would be troubling. If Bayern's analysis is correct and the memberless LLC remained a legal person, then we would have a completely unaccountable A.I. system with all the rights of legal persons and, because the LLC is memberless, no human who could be held responsible for harm to persons or property that the A.I. system causes.

That certainly is troubling enough. But at least if Bayern is right, the LLC itself could be held liable for any harms that the A.I. system causes. If, as this

article argues, Bayern's analysis is not correct, the result could be even worse. The original organizer of the LLC, having bought into Bayern's proposal, presumably would not attempt to supervise the A.I. system's operations. If the A.I. system causes injury, a court would have two choices: (1) use its equitable powers to hold the now-departed organizer responsible; or (2) hold no one responsible. Option (1) would obviously be the opposite of what the organizer intended, and the organizer may not have the resources to compensate the injured party anyway. Option (2) would mean that, in effect, the organizer had created a wild animal. We would still have a completely unaccountable A.I. system, but this time without any possibility of victims seeking redress from the LLC that the A.I. system controls.

As noted above, courts use common sense and examine the spirit and purpose of a statute when determining what a statute means. For these reasons, there is little reason to fear that a court would recognize a memberless LLC as a legal person. But courts generally do not get involved until *after* something has gone wrong. Given the speed with which digital systems can operate—and the equally impressive velocity of technology progress in the field of A.I.—courts cannot be relied upon to act as an effective check on an otherwise unaccountable A.I. system.⁸⁹ For this reason, legally questionable blueprints for A.I. personhood must be challenged, lest an unwary reader—whether intentionally or inadvertently—create the digital equivalent of a wild beast.

III. ALTERNATIVES TO A.I. PERSONHOOD: DIGITAL ANALOGUES

The questions posed in the preceding two sections were (1) whether A.I. systems should be persons and (2) whether they already could be. Having answered these first two questions in the negative, this question remains: If A.I. systems are not persons, then what are they? Or, to be more precise, how should the law treat them? Pinning down a firm answer to this question is essential for both the developers of A.I. systems and for society at large:

Clarifying the legal status of A/IS . . . is essential in removing the uncertainty associated with the obligations and expectations for organization and operation of these systems. Clarification along these lines will encourage more certain development and deployment of A/IS and will help clarify lines of legal responsibility and liability when A/IS cause harm.⁹⁰

Typically, when common law courts are faced with novel legal situations, they search for analogous components of existing areas of law. If personhood is taken off the table, what would be the appropriate legal analogue for an autonomous digital system capable—unlike any prior human invention—of taking

⁸⁹ See Matthew U. Scherer, *Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies*, 29 HARV. J.L. & TECH. 353, 368, 389–90 (2016) (discussing the likely need for *ex ante* action given the potential scale of risks associated with A.I., and discussing the shortcomings of the *ex post* common law tort system as a mechanism for managing the risks associated with A.I.).

⁹⁰ INST. ELEC. & ELECS. ENG'RS, *supra* note 11, at 148.

legally meaningful actions without specific human input? This final section discusses three possible digital analogues: products, animals, and agents. It ultimately concludes that the lattermost option provides the best mix of meaningful rules for the present and flexibility for the future.

A. Products

From my admittedly anecdotal discussions with other lawyers, the most commonly held view is that the traditional rules of products liability will apply to A.I. systems that cause harm. Those liability rules (at least in the United States) are in some ways reminiscent of the unlimited liability rules that traditionally applied to the owners of companies that are not themselves legal entities. In most instances, a company is strictly liable for any harm caused by a defective product that it designed, manufactured, or sold even if the company itself was in no way negligent. The most familiar form of this principle comes from the venerable Restatement (Second) of Torts, which makes clear that the manufacturer or seller of a defective product is liable for harm even if it “exercised all possible care in the preparation and sale of the product”:

- (1) One who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his property is subject to liability for physical harm thereby caused to the ultimate user or consumer, or to his property, if
 - (a) the seller is engaged in the business of selling such a product, and
 - (b) it is expected to and does reach the user or consumer without substantial change in the condition in which it is sold.
- (2) The rule stated in Subsection (1) applies although
 - (a) the seller has exercised all possible care in the preparation and sale of his product, and
 - (b) the user or consumer has not bought the product from or entered into any contractual relation with the seller.⁹¹

This rule arose in an age of assembly lines and centralized manufacturing, and still makes a great deal of sense for items produced through traditional industrial processes. But given the manner in which digital technologies—including but certainly not limited to A.I.—are often developed,⁹² imposition of strict liability could lead to outcomes that seem less than just. Specifically, a strict liability regime for A.I. could result in liability being assigned to parties that had only a highly attenuated influence on the finished system and could not have reasonably foreseen or prevented the harm.

As with all digital technologies, the programmers of A.I. systems generally make extensive use of open-source or “commercial off-the-shelf (‘COTS’)” software components rather than being programmed from the ground up.⁹³

The sheer number of individuals and firms that may participate in the design, modification, and incorporation of an AI system’s components will make it dif-

⁹¹ RESTATEMENT (SECOND) OF TORTS § 402A(1)–(2) cmt. a (AM. LAW INST. 1965).

⁹² Scherer, *supra* note 89, at 369–73.

⁹³ *See id.* at 370–71.

ficult to identify the most responsible party or parties. Some components may have been designed years before the AI project had even been conceived, and the components' designers may never have envisioned, much less intended, that their designs would be incorporated into any AI system, still less the specific AI system that caused harm. In such circumstances, it may seem unfair to assign blame to the designer of a component whose work was far-removed in both time and geographic location from the completion and operation of the AI system.⁹⁴

In addition, the increasing use and sophistication of machine learning distinguishes A.I. not only from pre-digital technologies, but also from other digital technologies. Machine learning enables an A.I. system to grow and change when exposed to new data, thus giving them the ability to learn “without being explicitly programmed” by humans.⁹⁵ This means that the manner in which an A.I. system operates may change—and perhaps change quite radically—depending on what it “learn[s]” during the course of its operations.⁹⁶ “[E]ven the most careful designers, programmers, and manufacturers will not be able to control or predict what an AI system will experience after it leaves their care.”⁹⁷ As a result, it may sit uneasily with our collective sense of justice to subject the developer of a learning A.I. system to the same strict liability as the manufacturer of a defective airbag.

Imposing the rules of products liability on A.I. would discourage innovation and creative applications of new A.I. technologies. The designers of learning A.I. systems, knowing that they face strict liability, would have a powerful incentive “to limit the ability of consumers and users to modify, adapt or customize their advanced AI and robotics products in order to retain greater control over how they are used.”⁹⁸ This would greatly reduce the potential for beneficial A.I. systems to have a positive impact on society.⁹⁹ A.I. thus seems to demand an approach that better accounts for the unique development trajectory of digital technologies and the unique autonomous potential of learning A.I. systems.

B. *Animals*

Animals may appear to be a more nuanced analogue for the legal treatment of A.I.-caused harm. Animals have a level of autonomy that consumer products

⁹⁴ *Id.* at 372.

⁹⁵ Margaret Rouse, *What Is Machine Learning*, WHATIS.COM, <http://searchenterpriseai.techtarget.com/definition/machine-learning-ML> [https://perma.cc/C5VY-YLPZ] (last updated May 2018).

⁹⁶ *See id.*

⁹⁷ Scherer, *supra* note 89, at 366.

⁹⁸ Peter M. Asaro, *The Liability Problem for Autonomous Artificial Agents*, ASSOC. ADVANCEMENT ARTIFICIAL INTELLIGENCE 190, 193 (2016) (“[W]e could pursue one of the heavy-handed liability schemes, such as strict liability, that would regulate the industry to some extent, but also limit innovation to those areas where there are sufficient profits to motivate large capital companies to enter the market and accept the risks.”).

⁹⁹ *See id.*

lack, but they still are not governed by a conscience “and possess great capacity to do mischief if not restrained.”¹⁰⁰ Consequently, legal systems invariably impose legal obligations on owners and keepers of animals to ensure that those animals do not cause harm to others. Similar impulses may well guide the legal treatment of A.I. systems.

In common law jurisdictions, the extent of an animal keeper’s duty traditionally depends on whether the animal is a “wild” animal or a “domestic” animal.¹⁰¹ For a wild animal that is considered dangerous by nature and kept as a pet, the animal’s owner or keeper is strictly liable for any injury or property damage that the animal causes.¹⁰² If a farmer has a pet wolf that kills two of his neighbor’s chickens, the farmer is legally responsible for compensating the neighbor for the lost chickens—even if the wolf had always been perfectly tame previously. The theory behind imposing such strict liability is that wild animals are inherently dangerous, such that a wild animal’s keeper is effectively on notice from day one that the animal presents a risk to others.¹⁰³

For domesticated animals kept as pets, however, the owner generally must have some knowledge of that specific animal’s dangerous propensity and thereafter failed to take adequate precautions.¹⁰⁴ In other words, if the farmer owned a golden retriever instead of a wolf in the previous example, the neighbor would have no remedy unless he could show that the dog had eaten a neighbor’s chicken or otherwise shown “dangerous propensities” at least once before. This rule gave rise to one of the more amusing legal expressions: every dog gets “one free bite.”¹⁰⁵

¹⁰⁰ EDWARD J. KIONKA, *TORTS IN A NUTSHELL* 41 (4th ed. 2005).

¹⁰¹ See *RESTATEMENT (SECOND) OF TORTS* § 506 (AM. LAW INST. 1977) (defining “wild” and “domestic” animals).

¹⁰² See *id.* § 507 (imposing strict liability where the wild animal has “a dangerous propensity that is characteristic of wild animals of the particular class, or of which the possessor knows or has reason to know.”).

¹⁰³ See *id.* cmt. c:

One who keeps a wild animal is required to know the dangerous propensities normal to the class to which it belongs. It is therefore not necessary in order for the rule stated in this Section to be applicable that its possessor should have reason to know that the particular animal possesses a dangerous propensity. He may reasonably believe that it has been so tamed as to have lost all of these propensities; nonetheless he takes the risk that at any moment the animal may revert to and exhibit them.

¹⁰⁴ Compare *id.* § 509 (imposing strict liability on keepers of domestic animals known to have “dangerous propensities abnormal to its class”), with *id.* § 518 (imposing only fault-based liability on keepers of domestic animals with no known dangerous propensities).

¹⁰⁵ See 3B C.J.S. *Animals* § 369 (2018). That expression is not quite true in a literal sense, however; even if a dog has not actually bitten someone before, the owner might face liability if the dog had previously shown aggressive or dangerous behavior. See also *RESTATEMENT (SECOND) OF TORTS* § 509 cmt. c (noting that the rule of strict liability for animals with known dangerous propensities applies even “if the animal is not vicious” if it nevertheless “has a dangerous tendency that is unusual and not necessary for the purposes for which such animals are usually kept”).

What lessons might animal liability law offer for A.I.? If we believe that A.I. systems are inherently risky (or if we just want to be extra cautious), we could treat all A.I. systems like wild animals and hold their owners strictly liable for harms that they cause. But such a blanket rule would seem unfair if applied to A.I. systems whose functions are so narrow that they do not present much of a risk to anyone. It would seem somewhat silly to treat AlphaGo, a system designed to play a board game, as if it is just as dangerous as an autonomous weapon system.¹⁰⁶

A better approach might be to treat different classes of A.I. systems as akin to different species of animals. The classification of system as “wild” or “domesticated” could be based on the intended function of the system—perhaps an autonomous security system is inherently dangerous, but a computerized tennis coach is not. Or it could be based on the operational history of A.I. systems with similar software and hardware—if a particular type of A.I. system has a proven track record of safe operation, it could be declared “domesticated” and their developers, distributors, and operators would enjoy relaxed standards of liability.

One obvious difference between animals and A.I. systems is that animals do not have human designers and manufacturers, and typically there are no more than one or two persons that are legally responsible for an animal at a given time. Thus, the principles of animal law run up against many of the same barriers as products liability in terms of their fitness as legal analogues for A.I.—they do not account for the fact that there may be many parties involved in the design and development of A.I. systems that cause harm, thus complicating the assignment and apportionment of liability.

C. Children

For those seeking a more anthropomorphic approach to A.I.’s legal status, children could serve as an interesting model. Children have very limited legal rights, but the limits on their legal rights are paired with limits on their legal responsibilities. Instead, for children, many of the legal rights and responsibilities of citizenship are instead held or exercised by their parents or guardians.

At the beginning of their lives, children have some passive rights under the law, such as the right to be free from abuse and the right to receive an education. They are not, however, “persons” in the legal sense. Children cannot vote, serve on a jury, or travel freely. Most important for purposes of this discussion, they cannot sue to vindicate their already-limited legal rights except through a parent or legal guardian. And even where children can be sued nominally, they

¹⁰⁶ Then again, even A.I. systems with a seemingly innocuous purpose could pose a risk to others if humans do not take appropriate safety precautions. As stated in the most widely used introductory textbook on A.I., “even if you only want your program to play chess or prove theorems, if you give it the capability to learn and alter itself, you need safeguards.” STUART J. RUSSELL & PETER NORVIG, *ARTIFICIAL INTELLIGENCE: A MODERN APPROACH* 1039 (3d ed. 2010).

generally lack independent financial resources sufficient to satisfy a judgment against them. The rights and responsibilities associated with a child's life and behavior generally lie with the parents rather than the child during the period of minority.

The Supreme Court's 1979 opinion in *Parham v. J.R.*¹⁰⁷ represents perhaps the starkest example of children's limited legal status under American law. The *Parham* case involved children whose parents committed them to state-run mental hospitals—a commitment processed deemed “voluntary” under state law because the children's parents (though not the children themselves) had requested the commitment.¹⁰⁸ The Supreme Court rejected the children's argument that being committed against their will without a pre-commitment fact-finding hearing violated their due process rights. The court reasoned:

Our jurisprudence historically has reflected Western civilization concepts of the family as a unit with broad parental authority over minor children. Our cases have consistently followed that course; our constitutional system long ago rejected any notion that a child is “the mere creature of the State” and, on the contrary, asserted that parents generally “have the right, coupled with the high duty, to recognize and prepare [their children] for additional obligations.”¹⁰⁹

Parents' rights of control over their children are accompanied by legal responsibility for their children's behavior; in most American states, parents can be held civilly liable for wrongful and injurious acts of their children.¹¹⁰ But as the *Parham* Court's reasoning implies, a child gradually gains legal autonomy and the parents' legal right and responsibility to control their children diminishes as the child matures. Once a child reaches adulthood, parents bear no liability whatsoever for even the most heinous acts.

A similar paradigm could be imagined as a legal analogue for A.I. systems. During the early years after its initial deployment, liability for harms caused by an A.I. system could rest with the designer(s) of the system and the persons responsible for deploying it, thus providing those persons with a strong incentive to supervise and control the system's operations. As the system develops a record of safe operation over the period of several years, the system could be allowed to gain additional autonomy, and the balance of legal responsibility could gradually transfer from the persons responsible for the system's design

¹⁰⁷ *Parham v. J.R.*, 442 U.S. 584 (1979).

¹⁰⁸ *Id.* at 589–91.

¹⁰⁹ *Id.* at 602 (alteration in original) (quoting *Pierce v. Soc'y of Sisters*, 268 U.S. 510, 535 (1925)).

¹¹⁰ Several states hold parents *strictly* liable for intentional or reckless harm caused by their children. *E.g.*, N.Y. GEN. OBLIG. LAW § 3-112(1) (McKinney 2018) (“The parent or legal guardian . . . of an infant over ten and less than eighteen years of age, shall be liable . . . for damages caused by such infant, where such infant has willfully, maliciously, or unlawfully damaged, defaced or destroyed such public or private property . . .”); OR. REV. STAT. § 30.765(1) (2018) (“In addition to any other remedy provided by law, the parent or parents of an unemancipated minor child shall be liable for actual damages to person or property caused by any tort intentionally or recklessly committed by such child.”).

and deployment to the system itself. The presumption under such a regime would be that all A.I. systems would eventually achieve full legal autonomy and personality, absent exceptional circumstances, and that the original designers and operators of the system would eventually be absolved of legal responsibility for the conduct of their mechanical progeny.

But the fact would remain that the end result of such a legal framework would be legal personhood for A.I. systems. For the reasons explained above,¹¹¹ that would be unwise given the current state of both the technology and society. In addition, such a framework would mean that the designers and operators of such a system would eventually, like the parents of children, be free from liability for the system's actions. Applying such a rule would ignore the fact that the designers and operators of an A.I. system play a more direct role in shaping an A.I. system than parents of children. As influential as parents are on a child's physical and mental development, they do not design a child's physical components or directly program a child's intellect or manner of interaction with the world.

D. Agents

In the future, A.I. systems will work with humans in many fields performing complex tasks, in much the same manner as human workers work alongside one another in the workplace.¹¹² The trend has, in fact, already begun; algorithms now perform many functions once performed by human workers, including "scheduling humans' meetings online, handling travel request forms[,] processing employment contracts . . . [and] helping manage warehouses and parking garages to boost efficiency."¹¹³ Physical workplaces are likewise seeing an increased degree of human-robot interaction with the rise of collaborative robots, or "cobots," which have "smaller physical footprint, lighter physical touch, and nimbler abilities" than earlier generations of robots, and thus are "easier to integrate among employees and existing machines."¹¹⁴ In many ways, companies have already begun using and thinking about A.I. systems in much the same way as human workers—as agents to whom they delegate tasks necessary to carry on the company's business.

This points to what is perhaps the most appealing analogue for A.I. systems: the legal treatment of agents and their principals. A.I. systems have long been described by both A.I. developers and academics as autonomous "agents"

¹¹¹ See *supra* Section I.B.

¹¹² Steve Bates, *Automation Is Killing, Creating and Transforming Jobs*, SOC. FOR HUM. RESOURCE MGMT. (Aug. 24, 2016), <https://www.shrm.org/resourcesandtools/hr-topics/talent-acquisition/pages/automation-killing-creating-transforming-jobs.aspx> [<https://perma.cc/TK9Q-AA9T>].

¹¹³ *Id.*

¹¹⁴ Matthew U. Scherer et al., *How to Manage Staffing & Morale During Robotics Adoption*, ROBOTICS BUS. REV. (Sept. 21, 2017), https://www.roboticsbusinessreview.com/cro/morale_robotics_adoption/ [<https://perma.cc/7G2C-RRS5>].

in a non-legal sense.¹¹⁵ In A.I. parlance, the term “agent” denotes a certain level of autonomy, in the sense that an agent has the ability to perceive aspects of its environment and act upon that environment to carry out a specified task.¹¹⁶ In law, the concept of *agency* revolves less around the characteristics of the agent *per se* and more on the nature of the agent’s relationship with its principal:

- (1) Agency is the fiduciary relation which results from the manifestation of consent by one person to another that the other shall act on his behalf and subject to his control, and consent by the other so to act.
- (2) The one for whom action is to be taken is the principal.
- (3) The one who is to act is the agent.¹¹⁷

An agent can be *general*, where the agent is “authorized to conduct a series of transactions involving a continuity of service,” as in the case of most employees, or *special*, where the agent is “authorized to conduct a single transaction or a series of transactions not involving continuity of service.”¹¹⁸

For several reasons, agency law would supply a particularly attractive framework for the legal status of A.I. systems.¹¹⁹ First, an agent can bind or create liability for a principal even if the agent itself lacks the capacity to sue, be sued, or enter into contracts, as in the case of children or the legally incompetent.¹²⁰ A principal thus can be held liable for the acts of an agent even in instances where the agent could not be held liable for those acts. Consequently, the fact that A.I. systems are not legal “persons” would present no barrier to treating them as agents of the persons or entities who created or deployed them.¹²¹

¹¹⁵ RUSSELL & NORVIG, *supra* note 106, at viii, 34 (describing the concept of an “intelligent agent” as the “main unifying theme” of the book, and defining an “agent” as “anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators.”).

¹¹⁶ *Id.* at 34–36.

¹¹⁷ RESTATEMENT (SECOND) OF AGENCY § 1 (AM. LAW INST. 1958).

¹¹⁸ *Id.* § 3.

¹¹⁹ The focus here is on tort liability rather than contract liability, as the ability of an A.I. system to form an enforceable contract involves conceptually distinct issues that are beyond the scope of this article. For a general discussion of contracts in which algorithms may determine a party’s obligations, see generally Lauren Henry Scholz, *Algorithmic Contracts*, 20 STAN. TECH. L. REV. 128 (2017).

¹²⁰ See RESTATEMENT (THIRD) OF AGENCY § 3.05 cmt. b (AM. LAW INST. 2006) (“It is not necessary for an agent, as to the action taken, to have capacity to hold legal rights or be subject to liabilities.”); see also RESTATEMENT (SECOND) OF AGENCY § 21 (AM. LAW INST. 1958) (“One whom a court has adjudged mentally incompetent but who retains volition, or one who has been deprived of civil rights, has power to affect the principal as fully as if he had complete capacity.”).

¹²¹ Much of hornbook agency law is devoted to the distinctions between “express” and “implied” agency and “actual” and “apparent” authority. See, e.g., 3 AM. JUR. 2D *Agency* §§ 14–16, 64–75. These distinctions are substantively immaterial in terms of the principal’s legal responsibility for the agent’s acts; principals are liable for the acts of implied agents and agents possessing merely apparent authority to the same degree as express agents with actual authority. See, e.g., *id.* § 71 (“Once established, apparent authority of an agent is the equivalent of expressly conferred authority as to third parties.”). The primary technical distinction

In addition, A.I. systems are likely to have had multiple entities involved in their design (and the design of their constituent hardware and software components), deployment, and operation. Under agency law, an agent can have multiple principals, either by being the agent of another agent (a status known as “subagency”) or by being the agent of two or more co-principals.¹²² Each principal can be held responsible for the agent’s tortious acts, as long as those acts are otherwise within the scope of the agency.¹²³ In the context of A.I. systems, this structure expands the range of potential sources for compensation if an A.I. system causes harm beyond the strictly limited number of people who can be held responsible for the acts of animals or children.

With that as background, A.I. systems could be deemed agents, with the system’s designers, manufacturers, and developers—i.e., those who gave the A.I. system the ability to do legally meaningful things—being the principals. As with human agents, an A.I. system could be either a general agent or a special agent, depending on the nature and extent of the principal’s input into the A.I. system’s design and operations.

From that point, the principals could be held liable for the A.I. agent’s acts under those circumstances where liability would attach under agency law. Those circumstances include:

- (1) when the agent engages in tortious conduct while acting in the scope of the agent’s authority;¹²⁴
- (2) when the principal is negligent in selecting, supervising or controlling the agent;¹²⁵ and
- (3) when the principal delegates the duty to supervise or control and the delegatee fails to perform those tasks adequately.¹²⁶

Taken together, these rules provide a viable framework for assigning liability for A.I.-caused harm.

For the first type of principal liability, the scope of agency authority could be defined in terms of the A.I. system’s capabilities and the precautions that the system’s upstream designers and deployers took to prevent downstream opera-

is that there are circumstances under which a principal is directly liable for the acts of an agent with actual authority but may only be vicariously liable if an agent’s authority was merely apparent. Compare RESTATEMENT (THIRD) OF AGENCY § 7.04 (AM. LAW INST. 2006) (direct liability for tortious acts of an actual agent), with *id.* § 7.08 (vicarious liability for tortious acts of an apparent agent). The framework suggested in this section would be to bypass these various distinctions and declare that A.I. systems are, by operation of law, agents of the persons that develop or deploy them, and are therefore liable for the system’s acts so long as it is within the scope of the system’s capabilities at the time the person ceased to have control over its development and operations.

¹²² RESTATEMENT (THIRD) OF AGENCY §§ 3.14–3.16 (AM. LAW INST. 2006).

¹²³ See *id.* § 7.03 cmt. d.

¹²⁴ *Id.* §§ 7.04, 7.08.

¹²⁵ *Id.* § 7.05.

¹²⁶ *Id.* § 7.06.

tors and users from expanding or altering those capabilities.¹²⁷ “Capabilities” here refers to the tasks that an A.I. system already can perform at the time of initial operation (call these “primary capabilities”) and, in the case of systems with machine learning capabilities, the tasks that the system can learn to perform with exposure to new data or environments (call these “learnable capabilities”) without further human modification of its programming or physical components (except for modifications that are offered or supported by the principal). The designer of an A.I. system would be excused from liability only if a downstream individual or entity modifies the system in a manner that makes it capable of performing tasks that go beyond even its learnable capabilities. In all other instances, the system’s acts would be deemed to be within the scope of the “agency” bestowed on it by its designers and operators.

For example, say that Designer creates The Identifier, a system capable of performing human identification, and markets it to a wide range of potential clients. Designer initially trains the system to recognize only the most immediately visible characteristics of a person—e.g., height, weight, hair color, and skin color—and distinguish individuals on that basis. Designer expects that the clients who purchase the systems will train the system to distinguish between more specific categories of people based on characteristics relevant to the context in which the system will be used.

Say that Retailer, a store that has suffered losses from a string of thefts, purchases The Identifier and not only trains it to identify known shoplifters, but also modifies the system so that it immediately deploys a stun probe against any individual identified as a known shoplifter. In this case, Designer would not be liable for anyone unlawfully stunned because modifying the system to stun people was neither something that The Identifier was designed to do nor something that it “learned” to do in accordance with its initial programming.

On the other hand, the second principle would ensure that a company could still be held responsible for harm caused by modified versions of its A.I. systems if the modifications were foreseeable and the company failed to provide safeguards against potentially dangerous modifications. Under agency law, those types of failures could be cast as negligence in training, supervising, and/or controlling the agent—and a principal cannot escape liability for such negligence by claiming that supervisory responsibility had been delegated to a subagent or third party.¹²⁸ Thus, Designer would be liable if Retailer used The Identifier to engage in racial profiling, unless Designer had explicitly provided warnings that declared any such use of the system to be unauthorized and taken

¹²⁷ “Upstream” and “downstream” refer to the stream of commerce, wherein, for example, a parts supplier is “upstream” from the manufacturer of the finished product, which is in turn upstream from the wholesaler, which is upstream from the retailer, and so on until the system reaches the end user. See *Upstream*, MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY (11th ed. 2003); *Downstream*, MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY (11th ed. 2003).

¹²⁸ RESTATEMENT (THIRD) OF AGENCY § 7.05 (AM. LAW INST. 2006).

reasonable care to ensure that The Identifier would not be used for that purpose. Using this structure, the developers of A.I. systems would effectively have a nondelegable duty to control and supervise systems that are modifiable by downstream parties.

An obvious analogy can be drawn here with the principles of products liability, where such failures to warn and failures to make safe are defects for which the manufacturers and sellers of the product can be held strictly liable.¹²⁹ But, for the reasons stated in the above discussion on the analogy to products,¹³⁰ strict liability is too blunt an instrument for a technology as inherently malleable as learning A.I. systems. Agency's negligence-based approach would still impose a duty on principals (i.e., designers and operators of A.I. systems) to ensure that the system operates safely, but it would only impose liability if those entities failed to exercise reasonable care in doing so.

Looking to agency law rather than products liability for a legal analogy makes sense on a more fundamental level as well. The goods that are the subject of the law governing products liability are not expected to possess autonomy or intelligence or to use discretion or judgment in carrying out a specified task. Agency law, by contrast, fully contemplates that agents will possess intelligence and may have varying levels of discretion in choosing how to carry out a task assigned by the principal. Agency law further contemplates that an agent may choose to carry out the task in a manner that deviates from the principal's expectations—and sometimes in a manner that runs directly contrary to the principal's instructions. That framework is better suited to the legal and ethical questions surrounding responsibility for A.I.-caused harm than laws governing devices that are expected to do nothing more than mechanistically carry out a human-specified action.

One possible objection to an agency-based approach is that, like products liability, it still could lead to the designers of even clearly innocuous A.I. systems and components being held liable for harms that could never have occurred without downstream modifications. Here, the before-mentioned principles of multiple agency would control. If a designer sells or deploys a system that it knows or should know downstream users may try to modify, then each downstream party that acquires the system from the designer could be treated as the designer's agents. Both legally and morally, this seems perfectly fair, since by providing a readily modifiable system, the designer may be deemed to have effectively given the downstream party authority to make modifications to the A.I. system. If a system is then sold or distributed to additional parties further downstream, those downstream parties would become subagents.

Assuming that these downstream parties themselves possess legal personhood and capacity, the rules governing when an agent's acts are attributable to a principal would determine upstream parties' liability. The upstream party

¹²⁹ See RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2(b)–(c) (AM. LAW INST. 1998).

¹³⁰ See *supra* Section III.A.

would be excused from liability if the modifications went beyond the scope of the downstream party's authority to use and modify the A.I. system; such a modification would break the chain of agency relationships for upstream parties. The upstream party then could be held liable only if it was itself negligent in providing the system to the downstream party or in failing to limit that party's ability to use and modify the system. This agency-inspired framework would strike a balance between ensuring that victims receive compensation and protecting designers and sellers of A.I. systems from liability for harm that results from transformations (as opposed to mere implementations) of their technologies.

In addition, the framework is sufficiently flexible that it could readily be adapted if future advances in A.I. technology make some form of A.I. personhood desirable. If some A.I. systems attain personhood, the legal system could simply cease treating such A.I. systems as a special class of agent, and would instead treat them merely as additional downstream agents. Agency's agnosticism on the issue of legal personhood thus would allow this framework to remain effective regardless of whether A.I. systems are granted some form of personhood.

CONCLUSION

We live in a society that is in no way ready or willing to accept A.I. personhood. A.I. systems have not yet reached a level where personhood would make economic—much less ethical—sense. But the current imprudence of creating A.I. personhood may be a function of the current state of the technology. These are still early days in the history of A.I. and many of the same objections that are commonly expressed about granting personhood to A.I.—most notably that it would discourage people from taking responsibility for their creations—were also said about the then-novel concept of corporate personhood in the 19th century. Gilbert and Sullivan even wrote an operetta—“Utopia Limited”—whose plot revolved around the chicanery and lack of responsibility that widespread adoption of the corporate form could wreak.¹³¹ Those objections have never completely gone away, but nevertheless the idea of corporate personhood is firmly entrenched. Society has grudgingly accepted the legal fiction of corporate personhood because humans retain ultimate control over a corporation's actions and because the corporate structure encourages investment and economies of scale.

Someday, similar economic and social forces might make A.I. personhood more appealing and practical. If, for instance, a government wishes to encourage the construction and use of autonomous elder care robots (such as the one depicted in the film *Robot & Frank*)¹³², it would make sense to come up with a legal framework that limits liability for the builders, distributors, and owners of

¹³¹ W. S. GILBERT & ARTHUR SULLIVAN, *UTOPIA LIMITED* (1893).

¹³² *ROBOT & FRANK* (Samuel Goldwin Films & Stage 6 Films 2012).

those robots. Creating some limited form of artificial personhood would then become a more appealing proposition. That appeal will likely increase as A.I. systems become more integrated into our economy and society, and gain the ability to engage in increasingly more complex acts with increasingly less human supervision.

An appropriately flexible legal framework should therefore ensure that victims have a route to seek redress for A.I.-caused harm regardless of whether the A.I. system is considered a legal person; recognize the unique manner in which A.I. systems can be designed and developed; account for the impact of autonomy and learning on the foreseeability of an A.I. system's behavior; and be sufficiently flexible to incorporate A.I. personhood into its framework should such a legal status become desirable in the future. Viewed through that lens, agency law provides the most promising analogue. Agency law is agnostic as to whether an agent is itself a legal person capable of being sued; a principal's liability does not depend on the agent's personhood. It thus provides a framework for handling liability for A.I.-caused harm regardless of whether A.I. systems attain personhood.

Regardless, the rise of A.I. will present the world's legal systems with their greatest conceptual challenge since the Industrial Revolution. Our laws were drafted under the assumption that legally significant decisions will be made by—and only by—human beings. That fundamental-but-unstated principle will break down as legally significant decisions are increasingly automated. But it would be foolish to accelerate that inevitable process of legal change. We must approach the legal status of A.I. systems with a clear and realistic sense both of what the law is and what the law should be.

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