The Cost of Personal Property Servitudes: Lessons for the Internet of Things

Christina M. Mulligan*

Abstract:
Why has the common law evolved to disfavor complex and nonpossessory personal property interests, while allowing comparative flexibility in real property? In recent decades, the blossoming of time shares, condominiums, and servitudes has dramatically increased variation in real property rights. But as restrictions on real property forms have eased, personal property forms have remained — and, indeed, have always been — severely and comparatively limited.

This Article will posit three reasons why simple, elegant interests are the norm in personal property. First, because personal property is small, mobile, and often fungible, the information costs associated with determining which property is burdened or fragmented are significantly higher than those associated with pieces of real property. Second, because personal property is generally inexpensive, the information costs associated with determining its status are frequently not worth paying. And finally, because the number of pieces of personal property one interacts with is so great, the information costs associated with correctly understanding them would be, in the aggregate, impracticable to pay if too many types of interests were permitted.

These reasons indicate that greater flexibility in property interests is most beneficial when property is distinct, valuable, and rarely encountered. In comparison, greater standardization is appropriate when property is fungible, lacks value, and is casually or frequently interacted with.

This analysis has implications for the debate within intellectual property law concerning the degree to which content owners may customize license agreements for using digital goods, software-embedded goods, and patented goods subject to conditional sales. Because the characteristics of intellectual-property-embedded goods bear a stronger resemblance to those of personal property than to those of real property, their use should be governed by the same straightforward rules as personal property rather than by the flexible and verbose terms in license agreements.

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I. Introduction

Why has the common law evolved to disfavor complex and nonpossessory personal property interests, while allowing comparative flexibility in real property? In recent decades, the blossoming of time shares, condominiums, and servitudes has dramatically increased variation in real property rights.¹ But as restrictions on real property forms have eased, personal property forms have remained — and, indeed, have always been — severely and comparatively limited.²

Although several scholars have discussed the disparate treatment of land and chattels at length,³ little attempt has been made to justify or explain the difference in treatment of these two types of physical property. As

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¹ See Thomas Merrill & Henry Smith, Optimal Standardization in the Law of Property: The Numerus Clausus Principle, 110 YALE L.J. 1, 15 (2001) (“In terms of creation of new concurrent interests, the most dramatic development has been the emergence of condominiums and time-shares.”); see also id. at 16-17 (“In response to demand for a more flexible instrument that would allow the burden of promises to run in planned residential developments, the English Court of Chancery, in Tulk v. Moxhay, in effect created a new interest — the equitable servitude. This was pure judicial entrepreneurship, as the court was well aware . . . .”).

² After Tulk v. Moxhay created equitable servitudes in England, the English Court of Chancery held that equitable servitudes could not be imposed on chattels. Zechariah Chafee, Equitable Servitudes on Chattels, 41 HARV. L. REV. 945, 977-80 (1928) [hereinafter Chafee 1928]; Merrill & Smith, supra note 1, at 18. Some courts have anomalously recognized particular chattel servitudes, but those cases tend to be seen as rare exceptions to the general practice and belief. See Merrill & Smith, supra note 1, at 18-19: Zechariah Chafee, The Music Goes Round and Round: Equitable Servitudes and Chattels, 69 HARV. L. REV. 1250, 1255 (1956) [hereinafter Chafee 1956] (discussing Pratte v. Balatsos, 113 A.2d 492 (N.H. 1955), which appeared to recognize a servitude on a jukebox, and noting that “[s]ince 1928 and until Pratte v. Balatsos, [the author had] found seven cases of attempts to bind personal property by restrictions unsanctioned by legislation, . . . only three of these were successful”); Glen O. Robinson, Personal Property Servitudes, 71 U. CHI. L. REV. 1449, 1456-57 (2004) (noting that the author “had discovered only a few cases decided since 1956 involving attempts to create common law servitudes”).

³ See, e.g., Chafee 1928, supra note 2; Chafee 1956, supra note 2; Robinson, supra note 2; Molly Shaffer Van Houweling, The New Servitudes, 96 GEO. L. REV. 885 (2008).
a result, we live in a world that treats usage restrictions on real and personal property very differently, without really knowing why.

Historically, maintaining different types of interests and restrictions on land and chattels has been met with skepticism. Henry Smith has noted that the suspicion of servitudes on chattels has been undertheorized.\(^4\) Glen Robinson, in particular, argued that the distinction fails to hold any water: “To the extent [particular] restraints [on usage] are valid for real property, they should be valid, pari passu, for personal property.”\(^5\) Molly Van Houweling has suggested that appropriate notice could justify enforcing servitudes on personal as well as real property.\(^6\) And while Lord Coke worried that downstream restrictions on chattels would limit their alienability,\(^7\) he was equally concerned with restraints on the alienation of land.\(^8\)

This paper investigates whether the distinction in flexibility between real property rights and personal property rights is justified by exploring the

\(^4\) Henry Smith, *Institutions and Indirectness in Intellectual Property*, 157 U. PA. L. REV. 2083, 2122 (“The law has always been more suspicious of personal than real property servitudes, but this area of law has been undertheorized.”).

\(^5\) Robinson, supra note 2, at 1453.

\(^6\) Van Houweling, supra note 3, at 907 (“[I]t is relatively easy for an item of personal property to travel with its terms attached directly to it . . . [T]he availability of this type of express notice might justify apply the logic of Tulk [*v* Moxhay, (1848) 41 E.R. 1143, which created equitable servitudes[,] to personal property, enforcing running restrictions upon a finding of actual notice.”).

\(^7\) 1 E. COKE, INSTITUTES OF THE LAWS OF ENGLAND § 360, p. 223 (1628). Coke’s discussion of chattel servitudes was recently discussed by the Supreme Court in *Kirtsaeng v. John Wiley & Sons, Inc.*, 133 S.Ct. 1351, 1363 (2013).

\(^8\) Chafee 1928, supra note 2, at 982 (citing COKE, supra note 7, at § 360) (“The . . . passage from Coke . . . is preceded by an equally strong condemnation of similar conditions for the reverter of real estate. Coke says nothing to indicate that land may be restricted and chattels may not, or that there is any distinction for this purpose between them.”).
differences between real and personal property and assessing why those differences might lead to choosing different degrees of flexibility in property rights regimes.

The paper then turns to a modern challenge for property rights — the “Internet of Things” and other software-embedded goods. Whereas once software and internet connections were confined to multi-purpose computers housed in variously-sized rectangular boxes, appliances such as thermostats, watches, jewelry and eyewear are increasingly being made available with networking capability. These networked objects make up the growing Internet of Things. Manufacturers typically require purchasers of these products to consent to terms of service (“ToS”) or end-user license agreements (“EULAs”) in order to use them, and these licenses create restrictions on how the products can be used or transferred. Under the common law, these licenses would be verboten if the inside of the product consisted of gears.


rather than processing chips. But because the products run copyrighted software, manufacturers are legally permitted to exert downstream control over the software’s — and thus the product’s — usage.\(^{11}\) Although personal property traditionally cannot be subjected to usage restrictions or servitudes,\(^{12}\) judges have been comparatively comfortable recognizing restrictions on products that run software (“software-embedded goods”), as well as patented goods subject to conditional sales.\(^{13}\) This flexibility has allowed for Monsanto to limit the use of its seeds to one growing season,\(^{14}\) for Canon to prevent digital camera owners from lending their cameras to others,\(^{15}\) and for Google to forbid resale of its new product, Google Glass.\(^{16}\)

Drawing from the comparison between real and personal property, this Article will argue that permitting servitudes or usage restrictions on

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\(^{11}\) See Part IV.A for a discussion of the legal mechanism that allows for greater downstream control of software-embedded products as compared with analog products.

\(^{12}\) See Merrill & Smith, supra note 1, at 18 (“[A]lthough the caselaw is rather thin, it . . . appears that one cannot create servitudes in personal property.”); Molly Shaffer Van Houweling, Touching and Concerning Copyright: Real Property Reasoning in MDY Industries, Inc. v. Blizzard Entertainment, Inc., 51 SANTA CLARA L. REV. 1063, 1068 (2011) (“While courts have increasingly accommodated land servitudes, the conventional wisdom under Anglo-American law has been that the types of servitudes that can be attached to land cannot be attached to chattels.”).

\(^{13}\) Dicta from a recent district court case renders less clear whether content owners can restrict resale of digital content that remains embedded in a particular piece of hardware. See Capitol Records, LLC v. ReDigi Inc., 934 F.Supp.2d 640, 656 (S.D.N.Y. 2013) (“Section 109(a) still protects a lawful owner’s sale of her ‘particular’ phonorecord, be it a computer hard disk, iPod, or other memory device onto which the file was originally downloaded. While this limitation clearly presents obstacles to resale that are different from, and perhaps even more onerous than, those involved in the resale of CDs and cassettes, the limitation is hardly absurd . . . .”).

\(^{14}\) See generally Bowman v. Monsanto, 133 S.Ct. 1761 (2013).


\(^{16}\) See David Kravets & Roberto Baldwin, Google is Forbidding Users from Reselling, Loaning Glass Eyewear, WIRED MAG., Apr. 17, 2013, http://www.wired.com/gadgetlab/2013/04/google-glass-resales/.
software-embedded goods and other goods protected by intellectual property law has the potential to cause substantial economic and social harm. Part II of this paper will give a brief overview of prior discussion of tangible property standardization, and Part III will argue that information costs explain why different degrees of flexibility are optimal in real and tangible property law. Part IV applies the discussion in Part III to intellectual-property-embedded goods. Finally, Part V examines potential alternatives to curbing restrictions on how chattel property can be used.

II. A Brief Overview of Property Interests and Property Standardization

In the past two hundred years, real property interests have evolved to include a great deal of flexibility. Equitable servitudes were originated in the 1848 English decision Tulk v. Moxhay,17 and over the past several decades, state legislatures have written statutes to permit the creation of property rights which had been forbidden under the common law, such as timeshares and condominiums.18

However, statutes authorizing the creation of time-shares do not extend to personal property.19 And although there are a few odd cases to the contrary, as a general matter, chattels cannot be burdened with servitudes.20

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17 (1848) 41 E.R. 1143.
19 Merrill & Smith, supra note 1, at 18.
20 See Merrill & Smith, supra note 1, at 18 (“[A]lthough the caselaw is rather thin, it . . . appears that one cannot create servitudes in personal property.”); Van Houweling, supra note 12, at 1068 (“While courts have increasingly accommodated land servitudes, the
While it is well-established that one can create a life-estate in personal property, “there are few if any cases that address the question of whether more exotic interests, such as defeasible fees and executory interests, can be created in personal property.”

The reason for the difference in treatment between land and chattels is far from clear, and previous attempts to account for the absence of chattel servitudes from the law are varied. Henry Hansmann and Reinier Kraakman noted that courts’ historic rejection of servitudes on chattels “was evidently motivated by considerations of competition policy that had nothing to do with the problems of notice that generally lie behind the law’s unaccommodating approach to divided property rights.” Robinson argued there was simply no market demand for encumbered objects. Chafee proposed two potential explanations: that servitudes would interfere with the quick transfer of conventional wisdom under Anglo-American law has been that the types of servitudes that can be attached to land cannot be attached to chattels.”

21 Merrill & Smith, supra note 1, at 17-18.
23 Robinson, supra note 2, at 1486.

[T]he principle constraint on the ability of property owners to carve out idiosyncratic property interests is not legal but economic. . . . [P]roperty law has neither the purpose nor the power to create a market for idiosyncratic property interests. . . . [C]ommon law personal property servitudes are like a liger — a zoo curiosity that, being sterile, cannot reproduce. As with ligers, so with watch time-shares: if the law allowed the creation of time-share interests in watches, it would have no more effect on the market for watches than releasing a sterile liger from the zoo into the wild would have on the gene pool of feline predators.

Id.
chattels, and that there would be “no possibility of affixing a reasonable termination to the life of the restriction [on a chattel] coextensive with the realization of [its] purpose.” Particular types of restrictions on chattels, such as resale price restrictions and tying arrangements, have been explicitly disfavored to prevent restraint of trade, but the reasoning of those cases is closely tied to the content of the restriction, rather than to a general policy concerning personal property rights.

A more convincing explanation for the difference of treatment between land and chattels can be discerned from the literature on the information costs associated with property use and transfer. Thomas Merrill and Henry Smith have written that limited forms of property rights — “the numerus clausus principle” — can be defended on the basis of the costs associated with investigating the scope of property rights. Using or transferring property requires one to understand the scope of the property interest and any restrictions on how it can be used. Learning these facts can be costly, especially if it is difficult to locate and understand the relevant information. Merrill and Smith argue that these information or measurement costs are higher when property can be held in more varied ways, because variety

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24 Chafee 1928, supra note 2, at 985 (“Land remains in the same hands for comparatively long periods of time and is transferred after an elaborate investigation of the title, whereas chattels are ordinarily sold with rapidity, so that possible interferences with quick transfers are undesirable.”); see also Robinson, supra note 2, at 1489 (discussing Chafee’s suggestion).

25 Chafee 1928, supra note 2, at 985. Chafee offered a contrast with the restrictions on land that “arise from the desire to protect a neighborhood as a rough unit.” Id. He wrote, “The restrictions do not endure forever, but lapse when the preservation of the desired neighborhood standard can no longer be accomplished. In the case of chattels, it might be argued that there is nothing analogous to a neighborhood purpose . . . .” Id.

26 See generally Merrill & Smith, supra note 1.
increases the cost of investigating and understanding the scope of one's property interests.\textsuperscript{27} They specifically argue there is some optimal standardization in property rights — enough flexibility that one can generally achieve one's goals, but not so much flexibility that the transaction costs of property use and transfer are too high.\textsuperscript{28} However, Merrill and Smith don’t provide a rubric for how to figure out what the right amount of standardization should be, nor do they discuss whether the “optimal standardization” would be different for different kinds of property. Instead, they state generally that “the numerus clausus provides a rough balance between the extremes of complete regimentation and complete freedom of customization, and thus leads to a system of property rights that is closer to being optimal than that which would be produced by either of the extreme positions.”\textsuperscript{29}

Merrill and Smith’s information costs analysis leads to a useful clue for why the law concerning land and chattels may have evolved differently. If the measurement costs for using and transferring chattels, as compared to land, rise more quickly as property standardization decreases, then the point of “optimal standardization” would be higher for chattels than for land.

\textsuperscript{27} Id. at 26-27 (“Parties who create new property rights will not take into account the full magnitude of the measurement costs they impose on strangers to the title.”); id. at 45 (“The very existence of idiosyncratic, hard-to-process property rights makes information about property rights harder to process.”).

\textsuperscript{28} Id. at 38 (“From a social point of view, the objective should be to minimize the sum of measurement (and error) costs, frustration costs, and administrative costs. In other words, what we want is not maximal standardization — or no standardization — but optimal standardization.”).

\textsuperscript{29} Id. at 39.
III. Information Costs of Land and Chattels

This Part will investigate the information costs associated with understanding the scope of real and personal property rights from three perspectives: the absolute cost of understanding a particular piece of property, the cost relative to potential losses from misuse or mistake, and the aggregate cost of understanding all the property one encounters. Information costs can consist of both discovery costs and processing costs. For the purpose of this Article, discovery costs are the costs of locating the information necessary to understand the scope of the property interest, such as the cost associated with finding a deed or matching a piece of property with a document describing a restriction or ownership structure.30 Processing costs are the costs incurred by parties trying to understand the scope of a property interest once they have acquired all the relevant information.31

30 Discovery costs are one of the types of transaction costs identified by Ronald Coase in *The Problem of Social Cost*. Coase explained:

In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on. These operations are often extremely costly, sufficiently costly at any rate to prevent many transactions that would be carried out in a world in which the pricing system worked without cost.


For simplification, this Part will presume that the information cost burdens associated with granting revocable, bare licenses\(^{32}\) to use a chattel or walk on a piece of land are borne by a current property owner, rather than the bare licensee. As we find in our own practical experience, the bare licensee usually trusts the owner without engaging in a separate investigation of property rights and rarely suffers from good-faith incorrect usage of the property. Similarly, complying with duties of abstention or simple avoidance of property one does not have an interest in are considered very low cost.\(^{33}\)

A. Absolute Information Costs

One possibility is that greater standardization in property forms is appropriate for chattels because the information costs associated with understanding the interests in the average piece of personal property are higher than for the average piece of land. Several qualities of chattels make this hypothesis appealing, specifically their size, mobility, and fungibility.

The largest pieces of personal property are objects like airplanes and trains. In one’s private life, it is rare to buy, sell, or rent an object larger than a car or grand piano — both of which are easily smaller than most pieces of

\(^{32}\) A bare license is a “license in which no property interest passes to the licensee, who is merely not a trespasser. It is revocable at will.” BLACK’S LAW DICTIONARY (9th ed. 2009) (license).

\(^{33}\) See J.E. PENNER, THE IDEA OF PROPERTY IN LAW 29 (1997); Smith, supra note 31, at 1117; see also Henry Smith, Property as the Law of Things, 125 Harv. L. Rev. 1691, 1703 (2012) (“[I]f a car is not mine, I do not need to know who owns it, whether it is subject to a security interest or lease, and so forth, in order to know not to take or damage it.”).
real property. Their size correlates with high potential for mobility. Most personal property, from pencils and cups to jewelry and fine art, can move with trivial effort from one location to another. Chattels are also frequently fungible, or at least challenging to differentiate. Many mass-produced factory items are identical in all meaningful respects. Even many unique items, such as gemstones and naturally-grown items, are difficult to distinguish among without learned expertise and detailed record keeping about defects and size, or the presence of unique identifiers like serial numbers.

Certainly, not all chattels are small, mobile, and fungible. The Hope Diamond is small and mobile, but many nonexpert individuals could identify it from among other gems (excepting attempts at forgery). Passenger train cars rival the size of many Manhattan apartments, but are relatively mobile and fungible. And heavy sculptures involving complex engineering may be small and, at least theoretically, fungible, but very difficult to move.

Nonetheless, most chattels possess all three qualities—pens, cufflinks, coffee mugs, toasters, desk chairs. Nearly all possess at least two. And these qualities each raise the information costs of property usage for a chattel. Consider at attempt to investigate whether there are any usage restrictions on a piece of land. Many locations now have organized, central

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record-keeping systems. But even in the absence of a reputable record-keeper, a potential buyer of real property often does not have to go far to locate the apparent, current owner and neighbors. Any documentation purporting to explain a restriction can easily identify the property by describing its physical location, address, or geographical coordinates. This is not to say that boundaries are never unclear or mistaken or that records are never lost. But recording systems and private record-keeping can usually inform someone interested in interacting with a piece of property how it is divided and how it can be used, with little concern that a record mistakenly refers to a different piece of property.

Chattels present a greater challenge. Consider the counterfactual universe where usage restrictions can run on chattels at the will of the manufacturer, and where a manufacturer produces a line of crystal glassware that could only be used by certain licensed persons. Like most chattels, each glass is small, mobile, and fungible. Fungibility raises the costs of using and conveying the property. There are many glasses; when the owner is trying to decide if she wants to hand a particular glass to a houseguest, she must try to remember whether this was the glass that was burdened with a usage

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36 Adam Mossoff contests the assumption that the boundaries of land interests are easy to measure in his essay, The Trespass Fallacy in Patent Law, 65 FLA. L. REV. 1687 (2013) (“[T]here are no formal empirical studies of how trespass or other real estate boundaries function in litigation.”). Tun-Jen Chiang responded to Mossoff’s essay by arguing that “based on our everyday experiences, the real property system seems to work reasonably well because we don’t feel too uncertain about our real property rights and don’t get into too many disputes with our neighbors. This is admittedly a loose intuition, but it is not an idealization . . . .” Tun-Jen Chiang, The Trespass Fallacy in Patent Law, PRAWFSBLAWG, Aug. 23, 2012, http://prawfsblawg.blogs.com/prawfsblawg/2012/08/the-trespass-fallacy-in-patent-law.html.
restriction, or whether it was some other, similar-looking glass in her cabinet. If she wants to give away or sell the glass, the successor in interest may similarly have difficulty establishing to his satisfaction whether some document that purports to describe the burdened glass actually referred to the particular glass under consideration.

The problem of fungibility is compounded by the size and mobility of chattels. Because real property is large and immobile, it is comparatively easy to identify it based on where it is. For similar reasons, it is easy to organize and locate records concerning property based on geographic location. In comparison, determining which chattel is burdened by what legal instrument is more difficult, even if the chattel is actually unique. A chattel can’t be uniquely identified by location because it can move; the glass in question might have been burdened in New York and then moved to Los Angeles. So either it has to be described precisely, possess a unique identifier, or some combination of the two. Although it is conceivably possible to place unique identifiers on many chattels, identifiers can be removed, and some objects are too small to easily place a visible serial number on. It’s also easy to imagine a frustrated owner scraping off an encumbered object’s serial

number and passing it off as a chattel held in fee simple. Unless all objects, or objects of a certain type, had unique identifiers, or every object were required to have a chain of title associated with it, obscuring the true identity of a chattel would be easy.

Theoretical matters aside, chattels are typically not labeled with unique identifiers. Limited run artwork is one common exception; computers are another. But while product packages are often manufactured with serial numbers, many small products can’t be labeled easily if separated from their packaging. Absent unique identifiers or physically-affixed notice, one would expect the discovery costs associated with understanding usage restrictions or divided interests on a chattel to be higher than a piece of land.

Alone, the higher “absolute” information costs associated with chattels are not necessarily a convincing justification for greater standardization in personal property rights. Just because there is, on balance, a difference in the information costs of interacting with chattels and land doesn’t tell us whether the information costs for transferring chattels are higher enough than the costs of transferring real property to justify different rules, especially when some land will be costly to investigate and some chattels will be comparatively inexpensive. But there are additional reasons to draw a categorical distinction.
B. Relative Information Costs

In many cases, the significant difference between personal and real property is not the absolute information cost of investigating potential property burdens but the information cost relative to the value of the good in question. Again consider the counterfactually burdened crystal glass worth $100, and an encumbered piece of land, which would be worth $100,000 when held in fee simple. If it costs $200 worth of expenditures and person-hours to discover and comprehend the property restrictions on the piece of land, a potential buyer can spend that $200 to save a great deal more, namely the loss associated with mistakenly using the property incorrectly or overpayment from the mistaken believe that the interest was undivided or unencumbered. If the entire property interest would be worth $100,000, but there is an easement running across it, the buyer may decide that it is only worth $90,000, and offer a lower bid for the property, potentially saving himself $10,000 — far more than the $200 information cost. Discovering a usage restriction after purchase would still be valuable if it prevents an owner from acting in a way that would cause over $200 in loss or damages. For example, if the owner was inclined to put a $1,000 statue on the property that would violate a servitude, and discovers that he may not, he’s saved himself $800 because he would no longer put up, and then be forced to remove, the statue.
The situation with comparatively inexpensive chattels can be different. It’s simply not worth spending $200 to discover how one can use the $100 glassware. Even if the glass turns out to be worthless to the owner or if he misuses or interferes with another’s rights to the glass, it’s most likely that the owner will lose $100 or less due to the misuse of the property, or to make another interested party whole, absent punitive damages. It’s not worth it to an owner to spend $200 to learn whether he can prevent the loss of $100.

Due to the low value of chattels, the information costs of learning about the property interests in a chattel will frequently be higher than the value of the chattel and any loss from incorrect usage. As a result, it will often be economically preferable to ignore servitudes and complex interests on chattels because it will not be worth investigating what they are.\textsuperscript{38}

This conclusion doesn’t fully answer why the law should treat chattels differently than real property; it merely descriptively explains why it would typically not be economically beneficial to identify and respect complex personal property interests if they were permitted. Nonetheless, one goal of property law is to promote efficient uses of property, and legal rules that encourage inefficient expenditures cut against that value. While some people

\textsuperscript{38} Louis Kaplow, \textit{A Model of Optimal Complexity of Legal Rules}, 11 J.L. ECON. & OR. 150 (1995) (arguing that rules will not affect behavior where they are complex enough that the costs of following them exceed liability for violations) (cited in Smith, \textit{supra} note 31, at 1146); Robinson, \textit{supra} note 2, at 1486 (“[T]he rational buyer will invest in information about a good (including information about the rights associated with it) only up to the point where marginal gains equal marginal cost. For low-valued goods this investment would be very low.”); Smith, \textit{supra} note 31, at 1146 (“Each dutyholder will engage in measurement up to the point where the added benefit in expected liability saved equals the additional cost of measurement. . . . If rights become too difficult to process, violation and liability might be the better choice.”).
will coolly decide that it’s not worth doing a record search on a cheap glass, others will feel a moral obligation to respect others’ rights and follow the law, even at a significant economic loss to themselves.39

C. Aggregate Information Costs

But perhaps the best justification for highly standardized property rights in chattels is the difference in the aggregate information costs associated with interacting with land and chattels.

In terms of real property, the total cost of investigating every piece of property one interacts with on a given day is low. There are properties one is interested in buying, selling, or using, and for everyone but the largest real estate tycoon, the number of such properties is very low. Because houses are expensive, and because they are rarely purchased and sold, it is not unreasonable to expect that every person thinking of buying or selling a piece of property, or using it in a meaningful way such as by farming or building on

39 Merrill and Smith argue,

Property can function as property only if the vast preponderance of persons recognize that property is a moral right, and this requirement has important consequences for the study of property. For property to serve as an in rem coordination device, the morality upon which it rests must be simple and accessible to all members of the community. . . . Pragmatism is too uncertain, and case-specific cost-benefit analysis is too demanding and error-prone, to supply the kind of robust and widely accepted moral understanding needed to sustain a system of property.

Thomas W. Merrill & Henry E. Smith, The Morality of Property, 48 WM. & MARY L. REV. 1849, 1850-51 (2007); see also Clarisa Long, Information Costs in Patent and Copyright, 90 VA. L. REV. 465, 516 (2004) (“When boundaries are difficult for observers to decipher, . . . the chances are high that observers will inadvertently infringe or will spend inefficient amounts of time and cognitive resources attempting to determine the contours of the many facets of the propertarian relationship.”).
it, would be able to take the time and expend the cost to investigate the
metes and bounds of their potential or actual interest. Considering one’s total
available time and resources, it is generally possible to investigate every real
property interest one wants to make use of, buy, or sell.

In contrast, consider the number of chattels one interacts with each
day. If usage restrictions were allowed to run on all of them, the costs
associated with understanding permitted usage would quickly balloon to
consume more time than any person has and can reasonably devote to
understanding the scope of one’s property rights. Can you lend your younger
sibling that shirt? Can the gemstone be cut out of its setting? Can it be
irrevocably broken into pieces? Can those plants be resold? Can their seeds
be planted? Each of these questions may not take much time to answer, but
answering all of these questions may be impracticable for a person to
complete. And, as Merrill and Smith pointed out, even if most chattels are
held in fee simple, the fact that some are subject to usage restrictions and
servitudes raises the cost of investigating all of them, because one doesn’t
know whether a particular chattel is held in fee simple until the scope of
rights has already been investigated.40

40 Merrill & Smith, supra note 1, at 26-27.
Parties who create new property rights will not take into
account the full magnitude of the measurement costs they
impose on strangers to the title. . . . Given the awareness that
someone has created a Monday-only right, anyone else buying
a watch must now also investigate whether any particular
watch does not include Monday rights. Thus, by allowing even
one person to create an idiosyncratic property right, the
Creating separate levels of standardization for land and chattels prevents the cost of investigating all potentially-burdened objects from getting too large. It is easy to identify whether something is real or personal property. If it is personal property, the investigation about burdens can effectively end there. If it is real property, in-depth investigations can be necessary but manageable in the aggregate.

This observation doesn’t prove that chattels should never be burdenable with servitudes or divided into complex interests. But it does indicate that, in order to keep the aggregate costs of property investigations manageable, the universe of potentially-burdenable property should be (1) readily identifiable as a burdenable type of thing, and (2) rarely encountered. Potentially-burdenable property should be readily identifiable as such so that costs are not mistakenly expended on objects that can only be subject to simple, easily-identifiable interests. And potentially burdenable property should be rarely encountered so that, in the aggregate, the costs of investigating those pieces of property remains low. Besides land, cars are a type of property that may be a good candidate for complex interests. It is generally easy to distinguish cars from other types of property, and most people buy, sell, and use only a few cars over long periods of time.

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information processing costs of all persons who have existing or potential interests in this type of property go up.

*Id.* at 26-27; see also *id.* at 47 (“[S]tandardization is imposed to control a negative externality created by the prospect that a few persons will deviate from possible forms.”).
In contrast, some classes of valuable chattels, such as large gemstones (as contrasted with small gemstones) would be poor candidates for complex interests because they would fail to be easily distinguishable from other chattels. The difference in value between large, valuable stones and small, commodity stones will exist on a spectrum and also be related to what kind of substance a stone is made of. Even if small stones were not burdenable, many might still expend unnecessary resources investigating the nature of the property rights associated with them by mistake, because the distinction between small, unburdenable and valuable, burdenable stones will not be clear. As a result, permitting complex interests for valuable jewelry could create unreasonably high aggregate measurement costs for those who buy, sell, and use other jewelry.

The upshot is, where measurement costs are concerned, there’s nothing exceptional about land particularly. Creating flexibility in ownership in any class of physical object will create corresponding costs. The key is to allow enough flexibility for individuals to achieve their goals without bearing burdensome costs. Based on how much cost a degree of flexibility creates, the degree of flexibility appropriate for a type of property will vary. Although there are a variety of reasonable ways the numerus clausus principle could have developed as applied to land and chattels,\textsuperscript{41} their separation into two

\textsuperscript{41} Indeed, the numeros clausus principle has developed in European countries in a variety of ways. \textit{See generally} Bram Akkermans, \textit{The Principle of Numerus Clausus in European Property Law} (2008).
basic regimes turns out to be a good rough cut at permitting beneficial flexibility while keeping costs low enough.

IV. Applications

A. The Internet of Things and Other IP-Embedded Goods

Heretofore, this Article has been an exercise in justifying the status quo — significant flexibility for land, comparably extreme standardization for chattels. But the emergence and growing popularity of networked objects has raised new and increasingly pressing questions about how the law should approach use restrictions on intellectual-property-embedded goods. How does the information cost analysis apply to personal property that is patented or contains a copyrighted work?

Traditionally, unprotected personal property, particular copies of copyrighted works, and patented goods have all been subject to the “first sale doctrine,” a principle which prohibits servitudes and other downstream control of a good by its manufacturer or prior owner after its initial distribution. In patent law, the rule remains a judge-created doctrine, more commonly known as the doctrine of exhaustion.\(^{42}\) Copyright’s first sale doctrine was famously stated in a 1908 Supreme Court opinion, Bobbs-Merrill v. Straus, which held that books containing copyrighted works could

not be subject to a requirement that they be sold at a particular price. The result was later codified in the 1909 Copyright Act.

In intellectual property law, the first sale doctrine plays the same role as it does in personal property law. By preventing manufacturers or previous owners from placing restrictions on how a good may be used after its initial distribution, it becomes inexpensive, from an information cost perspective, for an owner to allow it to be repurposed or transferred to someone else.

Two significant exceptions to the first sale doctrine have developed that allow for usage restrictions to run on some intellectual-property-embedded chattels. First, the Federal Circuit has allowed for patented goods to be sold subject to certain usage conditions, on the theory that if the patent holder does not have to grant any rights to a buyer, it may grant whatever combination of rights it chooses. Although sales of a patented good would generally trigger exhaustion of the patent owner's rights and prevent any further downstream control of the good by the patent holder, the Federal Circuit has allowed restrictions to run on a patented chattel “even when the chattel is sold if notice is given of the restrictions, such restrictions are within

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44 Section 41 of the Copyright Act of 1909 provided, “[N]othing in this Act shall be deemed to forbid, prevent, or restrict the transfer of any copy of a copyrighted work the possession of which has been lawfully obtained.”
45 See, e.g., Mallinckrodt v. MediPart Inc., 976 F.2d 700, 703 (Fed. Cir. 1992) (“The enforceability of restrictions on the use of patented goods derives from the patent grant, which is in classical terms of property: the right to exclude. . . . This right to exclude may be waived in whole or in part.”).
the scope of the patent grant, and the patent rights have not yet been 
eexhausted.”

Second, courts’ treatment of copyrighted software has evolved to allow 
for ongoing, downstream restrictions on how software can be used and when 
it can be transferred. The mechanism by which the first sale doctrine gets 
circumvented in the context of software is tied to how a computer running a 
software program works. In 1993, a Ninth Circuit decision, MAI Systems 
Corp. v. Peak Computer Inc., held that, because running a program created a 
temporary copy in a computer’s Random Access Memory (RAM), running a 
software program constituted prima facie copyright infringement of a 
copyright owner’s exclusive right to reproduce a copyrighted work. Although 
MAI Systems was initially controversial, two years later President Bill 
Clinton’s Working Group on Intellectual Property released a White Paper 
expressing the view that MAI Systems was a correctly decided and routine 
application of the law. The White Paper concluded that any use of a digital

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46 Winston, supra note 15, at 108; see also B. Braun Med., Inc. v. Abbott Labs., 124 F.3d 
1419, 1426-27 (Fed. Cir. 1997) (holding that patent exhaustion “does not apply to an 
expressly conditional sale or license”); Mallinckrodt, 976 F.2d at 709 (holding that a patentee 
could prevent reuse of a patented device if the device was labeled for a single use).
47 MAI Sys. Corp. v. Peak Computer, Inc., 991 F.2d 511, 518 (9th Cir. 1993): see also JESSICA 
LITMAN, DIGITAL COPYRIGHT 92 (2001) (“For all works encoded in digital form, any act of 
reading or viewing the work would require the use of a computer . . . , and would, under this 
interpretation, involve an actionable reproduction.”). Even absent the holding in MAI 
Systems, the proliferation of hard drives would have contributed to the merging of “usage” 
and “copying,” as programs are now rarely run from CDs or disks. Although 17 U.S.C. 
§ 117(a)(1) permits an “owner of a copy of a computer program to make . . . another copy . . . 
of that computer program provided . . . that such a new copy . . . is created as an essential 
step in the utilization of the computer program in conjunction with a machine and that it is 
used in no other manner,” this “essential step” exception does not apply to copying software 
that has been licensed but not sold. 17 U.S.C. § 117(a)(1) (2006).
48 LITMAN, supra note 47, at 94-95.
work constituted a prima facie copyright infringement because any copy of a
work loaded into a computer’s RAM constituted an actionable copy under the
copyright statute. As a result, the White Paper argued copyright owners
had the right to control whether and how someone read, listened to, or viewed
a digital work, even though the copyright statute did not allow copyright
holders to exert the same control over the use of non-digital works. While
the copyright statute does grant owners of copyrighted software the right to
make copies that are an “essential step” to using the program (e.g., making
RAM copies), this purported limitation on the rights of copyright owners
does little work in practice. Most software copyright owners instead choose to
license their software programs, and reserve whatever rights they choose
concerning how and when the program may be used. The resulting “terms of
use” or “end-user license agreements” that arrive with software programs are
frequently pages long and as idiosyncratic as contracts.

For the past few decades, most licensed software was run on general-
purpose computers, such as the typical desktop one might have in one’s home
or office. Then it was easy to distinguish the act of using software from using
other objects, and the information costs concerning use and transfer of
software-embedded goods may have been effectively segregated from other

49 See, e.g., Information Infrastructure Task Force, Intellectual Property and the National
web/offices/com/doc/ipnii/. For an alternate theory of how digital copies should be treated by
copyright law, see Aaron Perzanowski, Fixing RAM Copies, 104 NW. U. L. REV. 1067 (2010).
50 LITMAN, supra note 47, at 94-95 (citing White Paper, supra note 49, at 19-130).
types of personal property. By and large, most products that ran software looked like computers — grey, rectangular desktops or folding laptops. Just as it is easy to distinguish cars and land from other types of physical property, computers were easy to distinguish from other types of objects and appliances as well. Placing restrictions on how software could be used didn’t raise the aggregate information costs of using and transferring other goods, because it was trivial to distinguish a computer from a refrigerator.

The ease of identifying computers is quickly diminishing. Now there are smart thermostats, smart watches, and smart fire detectors. Cars run code. Wearable devices help quantify one’s exercise and physical habits. Most of these devices come with a corresponding license agreement governing use of the software, but those licenses sometimes use language that blends any distinction between the copyrighted software and the physical device. For example, the terms of use for Google Glass currently state, “You may not commercially resell any [Google Glass] Device, but you may give the Device as a gift, unless otherwise set forth in [an additional agreement]. . . . These Terms will also apply to any gift recipient.” Google Glass’s terms attempt to both limit how transfers of the device can happen, and to bind future owners of the device to the terms. While a pair of reading glasses could not generally be burdened this way without violating the first sale doctrine, the current trajectory of software licensing law is to accept these types of restrictions on how software and software-embedded devices can be used and alienated.

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As software is incorporated more frequently into personal property, the information costs associated with using and transferring personal property will increase. Computers are getting smaller, cheaper, and faster. Because almost anything can now be designed to run software, the amount of resources a person must expend to learn how to appropriately use the devices in their possession will increase, whether the objects in fact run software or not. If some watches run licensed software to keep time, the information costs associated with all watches will increase;\(^{53}\) even the purchaser of an analog watch will have to make sure the watch is not digital and thereby subject to a license agreement. Digital watch owners will need to take the time to read and understand the lengthy license agreement to determine what they are not permitted to do with their watches before beginning use or giving them away.

Both software-embedded goods and patented goods subject to conditional sales present the same problem: they allow for usage restrictions to run on chattels, raising the information costs associated with using not just these software-embedded or patented goods, but the costs of interacting

\(^{53}\) Merrill and Smith have elaborated on how allowing idiosyncratic interests in property raises the costs of all property investigation.

A and B may have subjective reasons for creating [idiosyncratic] property rights . . . . But, the possible existence of such rights will cause information costs for others . . . to rise. Those considering whether to purchase property rights . . . will have more to investigate: They will have to assure themselves that they are getting all the [rights] that they want. Furthermore, they will have to worry about dimensions of division and elaboration that perhaps no one has yet thought of, making the acquisition of any [similar piece of property] more uncertain as well as riskier.

Merrill & Smith, *supra* note 1, at 32.
with all chattels which may or may not be patented or contain software. As licenses on chattels become more common, people will come to expect their presence and be more likely to expend resources learning if a license exists and understanding its scope. Because distinguishing among software-embedded goods, patented goods, and other chattels will not always be easy, the information costs associated with using and transferring many chattels will rise as well because individuals will expend greater resources to discover whether “regular” pieces of personal property are subject to usage restrictions.

One appealing resolution is fairly straightforward: to rein in the flexibility that software license agreements have been given, and bring software-embedded products back into the legal world inhabited by their non-patented and non-digital counterparts. Perzanowski and Schulz point to an existing distinction within the copyright statute that could limit when idiosyncratic usage restrictions may apply.\textsuperscript{54} Section 106(3) grants copyright holders the exclusive right “to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending.”\textsuperscript{55} For Perzanowski and Schulz, Section 106(3) suggests that an authorized distribution of a copyrighted work, such as a piece of software, must either transfer ownership of the copy of the software,


\textsuperscript{55} 17 U.S.C. § 106(3).
or more temporary rights. They write, “If a consumer receives something approaching perpetual access in exchange for a one-time payment characterized as a sale, it is an easy case of exhaustion. If continued use and enjoyment of the work are conditioned on an ongoing payment, no sale has occurred and the consumer is entitled to no special privilege going forward.”\textsuperscript{56}

In other words, perpetual possession without ongoing payment should be legally understood as a sale, regardless of whether a license agreement purports to limit use of the work.\textsuperscript{57} Perzanowski and Schulz acknowledge that there will be grey-area cases, but anticipate that courts will be able to draw appropriate distinctions.\textsuperscript{58}

Perzanowski and Schulz’s characterization has the potential to work well in the context of specialized devices that run software, particularly because many intellectual property owners’ concerns with loss of control of their works are less in play. The software is intricately tied to the corresponding device; the program that runs a toaster, for example, would be of little value on a general purpose computer. As a result, concerns about end users making multiple copies or facilitating piracy are less worrisome. The combined package of a toaster’s software and chassis constitutes a rivalrous,

\textsuperscript{56} Perzanowski & Schulz, \textit{supra} note 54, at page [58 of the draft pdf].

\textsuperscript{57} A separate legal issue is ongoing subscription services that are provided through a device. For example, suppose one had a fitness-tracking bracelet containing software which tracked how many steps one took in a day. If one could keep the software and the bracelet indefinitely and purchased it for a one-time cost, it would be quite appropriate to designate that transaction as a sale. If, however, the company also provided a subscription service where it analyzed ones exercise habits and provided ongoing reports on its website, it would make sense to recognize that contracted-for service as separate from the property right in the bracelet.

\textsuperscript{58} Perzanowski & Schulz, \textit{supra} note 54, at page [58 of the draft pdf].
scarce resource, just like any other piece of personal property. When the information costs associated with using it are low, society benefits from the ease with which it can be used to serve different purposes for different people.

This is only one of several possible suggestions for how to keep information costs associated with transfer of intellectual-property-embedded goods low. But regardless of how the law in this area evolves, it will be important to acknowledge that the information costs associated with transfer of intellectual-property-embedded objects are driven up for the same reasons, and likely at the same rate, as they are for personal property generally.

B. Licensing of Other Copyrighted Works

Courts have been exceptionally willing to enforce software licenses, while simultaneously holding unenforceable attempts to license other types of copyrighted works. Nonetheless, copyright owners who would immediately benefit from greater control of their works, and who lack the incentives to worry about third-party information costs, have also been working to expand the end-user license agreement phenomenon to non-software and non-digital works as well. Currently, a popular home-workout DVD seller, Beachbody, insists that the DVDs it sells to customers are licensed, not sold, and threatens to sue those who try to resell their DVDs on eBay.\(^59\) Regardless of whether Beachbody’s suits would prevail in court, Amazon appears to have

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indulged the company by eliminating the option to buy “used” versions of the Beachbody DVDs from its site.\textsuperscript{60} Other companies’ exercise DVDs are generally available used.\textsuperscript{61}

Recently, the Ninth Circuit considered two cases which together suggest “software exceptionalism”\textsuperscript{62} is still the rule when it comes to licensing copies of copyright works. UMG Recordings v. Augusto involved promotional music CDs that had originally been sent to music critics and disc jockeys.\textsuperscript{63} Each CD had been marked with notice specifying that the CD was for promotional use only and was not transferable to parties other than the intended recipient.\textsuperscript{64} The defendant, Augusto, acquired the CDs from various sources and then resold them on eBay.\textsuperscript{65} UMG sued him on the theory that the CDs had been licensed, not sold, and that Augusto didn’t own or have the


\textsuperscript{62} Perzanowski & Schulz, supra note 54, at [22 of the draft pdf].

\textsuperscript{63} UMG Recordings Inc. v. Augusto, 628 F.3d 1175, 1176 (9th Cir. 2011).

\textsuperscript{64} Some CDs stated, “This CD is the property of the record company and is licensed to the intended recipient for personal use only. Acceptance of this CD shall constitute an agreement to comply with the terms of the license. Resale or transfer of possession is not allowed and may be punishable under federal and state laws.” \textit{Id}. at 1177-78. Others simply were marked, “Promotional Use Only—Not for Sale.” \textit{Id}. at 1178.

\textsuperscript{65} \textit{Id}. at 1178.
right to transfer the CDs. The Ninth Circuit held that UMG hadn’t created a licensing agreement by sending the CDs affixed with notice to recipients and that the CD recipients had gained title to the CDs.

The same day that *UMG v. Augusto* was decided the same panel of judges\(^\text{66}\) issued an opinion in a software distribution case, *Vernor v. Autodesk*.\(^\text{67}\) Similar to the facts in *Augusto*, Vernor resold on eBay CDs containing software which had purportedly been licensed. The Court concluded that Vernor did not have the right to sell the CDs by looking to the Ninth Circuit’s three-part test for determining whether software had been licensed or sold: first, “whether the copyright owner specifies that a user is granted a license”; second, “whether the copyright owner significantly restricts the user’s ability to transfer the software”; and third, “whether the copyright owner imposes notable use restrictions” on the work.\(^\text{68}\)

The holdings of *Vernor* and *Augusto* are difficult to reconcile. The most straightforward explanation for their opposite holdings is the notion of “software exceptionalism” — the notion that for some reason, licensing software is more acceptable than licensing other works.\(^\text{69}\) In *Vernor*, the Ninth Circuit explicitly uses a test that is specific to software. In *Augusto*, it

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\(^{66}\) Perzanowski & Schulz, *supra* note 54, at [22 of the draft pdf].

\(^{67}\) 621 F.3d 1102 (9th Cir. 2010).

\(^{68}\) *Id.* at 1106.

\(^{69}\) *See* Perzanowski & Schulz, *supra* note 54 at [22-27 of the draft pdf].
notes that “[p]articularly with regard to computer software, we have recognized that copyright owners may create licensing arrangements . . . .”\textsuperscript{70}

On the other hand, it is not necessarily true that the only plausible explanation for \textit{Augusto} and \textit{Vernor}’s holdings is that software may be easily licensed but other copyrighted works may not. The language of \textit{Augusto} also suggests that a reason the first sale doctrine applies is because the initial recipients of the CDs did nothing to assent to the license. The court writes, for instance, “Our conclusion that the recipients acquired ownership of the CDs is based largely on the nature of UMG’s distribution.”\textsuperscript{71} UMG’s original CD recipients were never in a position to decide whether to acquire the CDs with restrictions or not; the CDs simply showed up in their mail. It’s not clear that the Ninth Circuit would have come to the same result if the CDs were initially acquired in another manner. Although the factors that determine whether software has been licensed or sold, which were applied in \textit{Vernor}, do not at all consider the actions of the software purchaser or recipient, one wonders if there is not an unstated, fourth factor in the test, under which the initial receiver of the software must take some action concerning or acknowledging the license agreement.

However one reads \textit{Augusto} and \textit{Vernor}, it remains the case that courts are comparatively more comfortable enforcing licenses that sound in a digital environment rather than a physical. But commentators are beginning

\textsuperscript{70} \textit{Augusto}, 628 F.3d at 1180.
\textsuperscript{71} \textit{Id.} at 1180.
to point out that the licensing phenomenon as it has developed doesn’t quite fit with existing property or contract jurisprudence. Mark Patterson has noted out that courts frequently bend contract law beyond recognition to find “acceptance” in software licensing agreements, which would not suffice in other contexts. Christopher Newman argues that licenses are fundamentally creatures of property, and that conceptualizing them only as contracts often produces highly undesirable results. BJ Ard relatedly argues that the fusion of supra-compensatory copyright damages with the idiosyncrasy of contract terms raises problems of fairness and notice.

The inchoate status of licensing law creates the opportunity for change in many directions. This change can be positive, and move in a direction that reduces the information costs associated with using protected works. Or, the change can be negative, and create the opportunity for more variation in licensing and higher information costs for transactions within physical and intellectual property law. Just as with chattels that run software, permitting restrictive licensure of permanently-acquired goods has the potential to significantly raise the information costs associated with using and

72 Mark R. Patterson, Must Licenses Be Contracts? Consent and Notice in Intellectual Property, 40 FLA. ST. U. L. REV. 105, 114 (2012) (“The Federal Circuit and courts following it have suggested that...the post-sale notice can create a contractual license restriction. To reach this result, the courts distort contract law beyond recognition.”).

73 See Christopher M. Newman, A License Is Not A “Contract Not To Sue”: Disentangling Property and Contract in the Law of Copyright Licenses, 98 IOWA L. REV. 1101, 1109-10 (2013) (“The concept of license, I argue, belongs fundamentally to property, not contract.”); see also id. at 1103-05 (providing examples of where viewing a license as a “contract not to sue” a licensee would produce undesirable results).

74 B.J. Ard, Covenants, Conditions, and Limitations: Balancing Remedies with Notice in the Enforcement of Copyright Licenses (draft).
transferring personal property. Courts and private intermediaries should be reluctant to enforce or respect these attempts without considering the effects they have on property sale transaction costs as a whole.

C. Digital Goods and Disembodied Software

Keeping the permissible property interests of software-embedded chattels aligned with other types of personal property makes sense from an information cost perspective. And because the software is inextricably connected to a particular, specialized device, one can see how a system governing “smart devices” will tend to work similarly to how personal property transfers have historically functioned.

A more complicated question is how to develop a sensible way to govern the transfer of disembodied digital works — software that runs on a general-purpose computer, including digital media such as ebooks, and music and video files. Even if one eliminated the holding of MAI Systems, the core differences between physical and digital goods demand a more nuanced answer to the question of how digital objects should be treated under the law. Whereas previously, one might take a CD out of one’s home entertainment system to use in a portable player or to lend to a friend, now moving an mp3 from a desktop to an mp3 player or to a friend’s computer requires making a copy. Courts have entertained the idea that digital works may be transferred when the device they are on is transferred as well, because no new copy in
made in the process. But the reality of how people use computers makes this an inapposite answer to the general question of whether copyrighted digital works can be sold or transferred. In the absence of appealing alternatives, courts look to license agreements to determine what rights an end-user has over a digital work. But just as with personal property, use restrictions on digital works have the potential to create problematically high information costs.

Previously, this author has suggested that licenses to digital works should be required to grant a minimum of a transferable personal use right to licensees. Many others have argued that something akin to a digital first sale doctrine would generally be beneficial. The company ReDigi has attempted to create an experience analogous to reselling physical copies of works by designing a system that “resells” a digital work by sending the

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75 See Capitol Records, LLC v. ReDigi Inc., 934 F.Supp.2d 640, 656 (S.D.N.Y. 2013) (“Section 109(a) still protects a lawful owner’s sale of her ‘particular’ phonorecord, be it a computer hard disk, iPod, or other memory device onto which the file was originally downloaded. While this limitation clearly presents obstacles to resale that are different from, and perhaps even more onerous than, those involved in the resale of CDs and cassettes, the limitation is hardly absurd . . . .”).


buyer a copy while deleting the seller’s.\textsuperscript{78} However, courts have not yet embraced ReDigi’s notion of digital resale.\textsuperscript{79}

But while the status quo may seem overly restrictive of digital resale, a “strong” digital first sale doctrine would also create difficulties for copyright owners trying to extract payment from their works. Whenever someone was not actively using a file, a robust first sale doctrine would permit it to be rented out or resold. Hundreds of people would be able to share the same incarnation of a work, so long as only one person was using it at a time.

With this issue in mind, one might be tempted to embrace restrictive licensure for digital works instead. It may be that information costs associated with digital works would increase, but that it wouldn’t matter much given the low marginal cost of copyright owners creating new digital copies. In other words, there is little need to create ideal rules for allocating resources when there is no scarcity. But despite the ease with which digital files can be copied, over time, even digital works become scarce when copyright owners cease to make them available and files degrade or are destroyed.\textsuperscript{80}

Looking at property law and the law of how resources are allocated through an information cost lens helps one think about these challenges, but doesn’t yield a single solution. Property law makes an imperfect, rough cut at

\textsuperscript{78} ReDigi Inc., 934 F.Supp.2d at 645-46; see also ReDigi, https://www.redigi.com/ (last visited July 3, 2014).
\textsuperscript{79} ReDigi Inc., 934 F.Supp.2d at 644.
\textsuperscript{80} See Reese, supra note 77, at 592-610, 630-44.
how resources may be allocated, sacrificing the ideal world for estimates which are good enough, towards the end of keeping information costs low enough that property allocation and use stays manageable.\textsuperscript{81} There is, then, potentially more than one “good enough” way to delineate rights in disembodied digital objects. Exploring what these all might be would take this Article on a long tangent. However, the values of keeping information costs low and facilitating the ongoing use of digital works should play a significant role in determining what those rights or structures should be.

V. Alternatives to Standardization: Tag and Track Everything

Bar code scanners, radio frequency identification (“RFID”) tags, digital rights management (“DRM”) software, and a host of other technological advances are in a position to change the information costs associated with property usage. Whereas humans once bore the full burden of figuring out what they could do with their property, new technologies may be able to lower and absorb those costs. The prospect of lowering information costs comes with the effect of greater surveillance of everyday life, of how and where one uses objects, as well as who uses them. So before jettisoning property standardization in favor of greater automation, it’s worth considering whether this alternative is effective or desirable.

\textsuperscript{81} See Smith, supra note 33, at 1704 (“The architecture of property emerges from the process of solving the problem of how to serve use interests in a roughly cost-effective way.”).
The content of standard property forms and what rights the government will recognize is a choice that can reflect a number of social values, as well as impact information costs. Hanoch Dagan argues the forms of property offer “a tentative suggestion to parse the social world into distinct categories of interpersonal interaction.” Joseph Singer writes that the existing system of estates in land reflects the “values that shape the contours of the social relations in a free and democratic society.” In short, the choices of how and how much to standardize property can and do speak to values besides economic efficiency. While technology may be able to decrease information costs so as to economically allow for the encumbrance of chattels, there are other social costs which arise in the place of those information costs saved.

The problem of high information costs stems from the fact that humans bear the costs of compliance. Just as humans read and implement the text of wills specifying complicated inheritance rules, humans also bear the obligation of reading the dozen or more pages of End User License Agreements and Terms of Service and confining their behavior to that which is permitted by the license. One major justification for refusing to enforce complex property interests or restrictive license agreements would be if, in the aggregate, they could not all be read and comprehended in a practical

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amount of time. Economists have estimated that individuals who read every
privacy policy they agreed to online would each spend about 244 hours, or 42
minutes a day, per year reading policies.\textsuperscript{85} Lengthy licenses for software
would similarly take an inordinate and unrealistic amount of time to read,
particularly as the number of software-embedded goods increases. Even
Supreme Court Chief Justice John Roberts admits he doesn’t read End User
License Agreements.\textsuperscript{86}

But what if something else kept track of how objects could be used, and
informed users the result, or simply prevented the forbidden action from
being taken entirely? To varying degrees, this is becoming technologically
feasible. Digital rights management technology was an early incarnation of
this practice. Using DRM, software programs or digital content can be
designed to only run with the proper password or other permission, or to only
work for a fixed amount of time or for a certain number of uses. But the
failures of DRM are legion, particularly when the technology fails on its own

\textsuperscript{85} Aleecia M. McDonald & Lorrie Faith Cranor, \textit{The Cost of Reading Privacy Policies}, I/S: A JOURNAL OF LAW & POLICY FOR THE INFO. SOC'Y, 2008 Privacy Year in Review Issue, at 17, available at http://www.aleecia.com/authors-drafts/readingPolicyCost-AV.pdf; see also Dan L. Burk, \textit{DNA Rules: Legal and Conceptual Implications of Biological “Lock-Out” Systems}, 92 CAL. L. REV. 1553, 1584 (2004) ("The inability of the general public to track all the myriad permutations of mass market licenses is well illustrated by the frequent appearance of outrageous terms in such contracts[. . .]including provisions that forbid criticism of the product or . . . conferring . . . upon the publisher of web page design software a right in the web pages designed using the software purchased.").

terms and blocks people from accessing content they have a license to access. For example, several software companies have experimented with requiring computers running the software to always be connected to the internet, and writing their software to continually “check in” with the companies’ servers to establish that the software has been paid for.\(^\text{87}\) Failures of these systems, resulting in users being blocked from accessing the material they already paid for, have inadvertently created incentives for users to make and find unauthorized, infringing copies of the software or content, stripped of the DRM.\(^\text{88}\) Even when DRM works, it is often designed to prevent people from


using material in legal ways, such as making fair uses or other excepted reproductions under the copyright act. Because the boundary between a fair use and an infringing use is not precisely determined and, indeed, often the subject of hotly contested lawsuits, a well-meaning designer of DRM would not even be able to include an exception for fair use because he could not encode a “judge on a chip.” While a protection measure could be designed to yield access to any user who simply claimed to have a legal reason to access it, this would undermine the goal of having an automated process, rather than a person, bear the information costs surrounding usage.

Nonetheless, while DRM is reasonably effective at controlling certain kinds of uses, it has limits. A digital camera’s license, for example, may prevent “lending” the camera to another. Most DRM we encounter cannot act to prevent this. Maybe a camera could require a password to work, but the owner could just tell the borrower what the password is. The camera’s software could constantly remind the owner that lending is not allowed, but in that case it would have to remind the owner of all other limitations,
requiring the owner to read and comprehend them, again undercutting the goal of reallocating information costs to automated systems.

DRM may historically have been riddled with implementation problems, and in some cases, it cannot be designed to permit only prescribed uses of a product. But we can still, at least, imagine products that engage in sufficient surveillance of their surroundings to accurately determine how they can be used. For software-embedded goods, the product would refuse to function in a disallowed way. Other articles of tangible property could be tagged with an RFID chip or unique serial number. When certain events occurred, such as transferring ownership or relocating a chattel, the article could be scanned and a separate computer could analyze whether the proposed use or transfer were permitted.

These hypotheticals are less far-fetched than they first appear. In 2012, Microsoft filed for a patent titled “Content Distribution Regulation by Viewing User.”92 The patent envisioned a system where someone would, for example, purchase a license for a certain number of viewers to watch a movie through the Xbox 360 system. The Xbox 360 Kinect, which is equipped with a camera, would then continuously monitor whether more people than licensed were watching the film by counting the number of people in the room.93 The patent application explained, “if the number of user-views licensed is

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exceeded, remedial action may be taken.”94 Few products are more Orwellian than a television that watches you back. But the Microsoft ‘904 patent application is only the tip of the iceberg. Some cars are also being outfitted to include “engine shut-off devices,” which automatically stop cars from running when car payments are late.95 These devices communicate wirelessly to lenders or dealers. When a payment is late, the device warns the customer that a deadline is imminent and shuts off the car several days after a payment is due and missed.96 The cars also include global positioning system (“GPS”) devices that can locate the car remotely, “to speed up the repossession of the vehicle, if necessary.”97 More positively for car owners, these types of devices can also be used to locate and shut down cars when they are stolen.98

The Microsoft ‘904 Patent Application and engine shut-off devices highlight two key values that would be undermined by encoding DRM on or tagging-and-tracking everything: allowing for unanticipated, necessary uses of property, and protecting privacy.

94 Id. (Abstract).
96 Id.
97 Id.
98 Id.
A. Necessity and Efficient Breach

Under the common law, one could invoke “necessity” as a defense to claims of trespass or conversion. In the case of public necessity, one has the privilege to trespass or convert chattels “if the act is or is reasonably believed to be necessary for the purpose of avoiding a public disaster.”⁹⁹ One may also invoke a similar defense when private welfare is at risk — “if it is or is reasonably believed to be reasonable and necessary to protect the person or property of the actor, the other or a third person from serious harm . . . .”¹⁰⁰

When relying on a private necessity defense to protect anyone besides the relevant chattels’ owner, the actor is liable for any harm caused, but not for nominal or punitive damages.¹⁰¹ Variations on the necessity defense also appear in numerous states’ laws and in the Model Penal Code.¹⁰² The Model Penal Code provision is aptly titled “Choice of Evils” and provides that “[c]onduct that the actor believes to be necessary to avoid a harm or evil to himself or to another is justifiable, provided that . . . the harm or evil sought to be avoided by such conduct is greater than that sought to be prevented by the law defining the offense charged[,]” among other requirements.¹⁰³

Regardless of the precise contours of the necessity defense in civil and criminal scenarios, the purpose of these exceptions to generally applicable

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⁹⁹ Restatement 2d of Torts, § 262; see also Restatement 2d of Torts, § 196 (describing a defense of public necessity for trespass to land).
¹⁰⁰ Restatement 2d of Torts, § 263(1); see also Restatement 2d of Torts, § 197 (describing a defense of private necessity for trespass to land).
¹⁰¹ Restatement 2d of Torts, § 263(2); Restatement 2d of Torts § 263 (comment e).
¹⁰³ Model Penal Code § 3.02(1).
regulations of conduct is plain. Although individuals are likely to disagree about exactly under what circumstances law-breaking is “the lesser evil,” most would agree that there are circumstances where it is preferable, or even morally requisite, to break a law in order to avoid a harmful result.104 Adding DRM to real-world objects, such as cars, weapons, or computers, in order to enforce ownership rights risks making rights-infringing, but necessary, decisions impossible.105 Hypotheticals are not difficult to spin out. One may need to drive a car to avert an emergency, or need to alter a thermostat when the weather takes an unexpected, freezing turn.

Still other license violations don’t implicate avoiding bodily harm but simply evoke the contract-law notion of efficient breach. Maybe one simply needs to borrow another’s Google Glass or smart watch at the last minute, in order to access certain information while engaging in a contentious business meeting. The borrower of the glasses or watch would be happy to pay for the entire product, but simply didn’t have the opportunity to acquire one before she needed it. So she borrows another person’s, in violation of the license agreement. This is a case where actual damages to the licensor are virtually nonexistent, but the benefits to the borrower may be enormous. Allowing

104 Discussing when precisely such law violations are and aren’t justified would go far beyond the scope of this paper, but discussions of the topic include Christie, supra note 102; JULES L. COLEMAN, RISKS AND WRONGS 282 (1992).
105 Alternatively, a product could simply record license violations and charge the infringer some appropriate amount of damages for each violation. This would preserve the ability for end users or chattel possessors to make economically efficient and socially beneficial uses of the objects in their possession while still permitting licensors to enforce their license. On the other hand, issues of due process would quickly rear their heads, creating a different, but similarly problematic drain on licensees’ and licensors’ time and resources.
parties to breach the license seems, on balance, preferable to simply preventing the article from functioning ex ante. And if these licenses sound implausible, consider that the license for Microsoft Office: Home & Student Edition nominally forbids houseguests from sitting down at one's computer and using Word or Excel.  

Although the threshold at which violating licenses and servitudes become appealing will change based on the remedies available to a harmed party, the “end-user” or the person in possession of the chattel, should have the power to decide how to use it to a given situation. That the choice of how to use a chattel remains with its possessor, instead of a licensor who drafted rules about how it can be used months or years before, is valuable because the current possessor will have far better information about whatever situation she is in than the license drafter did. In effect, the relationship between a license drafter and end user is somewhat analogous to the relationship between a central economic planner and an individual.  

A common argument against extensive centralized planning is that a small group of planners cannot realistically gather and process enough information to anticipate the situations and needs of the hundreds of thousands of

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107 Cf. F.A. Hayek, The Use of Knowledge in Society, 35 AM. ECON. REV. 519, 524 (1945) (“We need decentralization because only thus can we ensure that the knowledge of the particular circumstances of time and place will be promptly used.”).
individuals who will be affected by their decisions. As a result, trying to anticipate exactly how many cars, chairs, coffee beans, and cherry pies to make available at any given place at any given time becomes an impossible task because of the number of variables that must be taken into account.

The licensor faces the same problem as the central planner, but lacks the incentives to try to reach an optimal result. While a central planner’s stated goal is to justly and effectively allocate resources to the public, the licensor drafting a EULA writes with the manufacturer or distributor’s best interests in mind, not the end user’s. The licensor will typically not care if once in a while a chattel won’t let its possessor use it in a way that is very important. The market will have some tempering effect on the strictness of these limitations if they are frequently a cause of frustration. But so long as the chattel doesn’t stop working often, there likely won’t be enough market pressure to alter how a particular device is permitted to function.

B. Privacy

Even assuming software can be written that correctly assesses whether a chattel’s use or transfer is authorized, and which allows for unauthorized uses when necessary or efficient, outsourcing the information costs associated with authorized property uses will create concerns about privacy. Any system trying to answer the question of who can use what, when, where and under what circumstances will have to know where the

108 Id. at 519-20.
object in question is, who is using it or whom it is being transferred to, and other details depending on how restrictions are designed.

Much has been written about the harms, real and potential, of massive data collection by private companies of personal information. Belief that one’s internet search queries are being read by the government has been shown to chill the content of searches one makes. The notion that one’s uses of various products are also being recorded by private parties would reasonably have similar effects. Moreover, losing privacy has the potential to impact many other aspects of one’s life and personal development. Among other values, privacy promotes “autonomy, self-fulfillment, socialization, and . . . freedom from the abuse of power.” Julie Cohen makes the case that privacy “is an indispensable structural feature” of our political systems and that freedom from surveillance is “foundational to the capacity for innovation” and self-development. Neil Richards warns that “surveillance of people when they are thinking, reading, and communicating with others . . . is especially dangerous because it can cause people not to experiment with new, controversial, or deviant ideas.” These negative effects of loss of privacy exist even when someone has “nothing to hide.”

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113 See generally DANIEL J. SOLOVE, NOTHING TO HIDE (2011) (criticizing that argument that privacy is not necessary when one has “nothing to hide”).
Admittedly, products such as the one described in Microsoft’s Content Distribution patent application are an exercise in self-help. Even in the absence of personal property servitudes or restrictive licenses, nothing currently prevents Microsoft from conditioning its service on its device counting a small number of people in a room. Yet, suggesting massive private surveillance as an alternative to property standardization will likely encourage privacy intrusions which the benefits of property flexibility will not justify.

In summary, while alternatives to property standardization may exist in theory, they arrive with their own sets of problems and potential harms. Lowering information costs with technology will likely prove ineffective, prevent some necessary uses of property, and undermine important privacy values.

VI. Conclusion

In 1928, Zechariah Chafee concluded his exploration of equitable servitudes on chattels with the observation that “the present failure to enforce such restrictions has not caused obvious evils. . . . Until the need for . . . servitudes on chattels becomes more certain, they are not likely to acquire assured validity.”114 The need for servitudes on chattels never became certain, but “servitudes” have nonetheless evolved with vigor in the realm of

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114 Chafee 1928, supra note 2, at 1013.
intellectual-property-embedded goods. This paper attempted to explain the historic divergence of servitude law on land and chattels in terms of the information costs associated with investigating and understanding property interests. In doing so, it established that the justifications for high standardization in personal property are similarly applicable to intellectual-property-embedded goods. As a result, attempts to create servitudes on chattels should continue to be viewed with suspicion, even when the property is patented, runs software, or otherwise contains a copyrighted work.

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115 See Van Houweling, supra note 3, at 924-49 (describing software license agreements as “the new servitudes”).