Adjacent Property Rights? Post-Sale Confusion and Property Rights in 3D Printing

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This paper argues that in the light of various infringement activities of trademark rights, perpetuated by three-dimensional (3D) printing, there is the need for flexibility in enforcing intellectual property laws. Further, this paper proposes the need for a new category of property rights. This new category of property rights, described as adjacent property rights, which applies to 3D printed goods that give rise to post-sale confusion under trademark legal doctrine. The discussion is framed against the property rights doctrine and develops the necessity of the adjacent property rights theory from a utilitarian perspective. This discussion is in light of the fact that 3D printing forms part of the creative and innovative process of society. In this regard, the strict enforcement of intellectual property rules to combat the expansion of 3D printing for commercial purposes only weakens consumer welfare and lessens the economic development of society that relies on innovation for development.

Keywords: 3D Printing; Post-Sale Confusion; Property Rights; Adjacent Property Rights

1. Introduction

The institution of intellectual property is quite enigmatic when it comes to property rights theories. There is still a vibrant debate going on regarding intellectual property and property rights from various perspectives, such as philosophy, economics, legal, and several others, which contemplate the best methods and approach to property rights.¹ There is no one uniform approach to property

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rights; as property rights are the quintessential foundation of society on which the democratic, economic, and legal structures are built.

Without these foundational elements in a society, it is safe to argue that un-organized communes do not meet the qualifications to be called a society. Or, at least, un-organized communes are not part of the civilized digital world. Instead, they should be seen as dark web communes where chaos and appropriation of property are part of their natural environment. Nowadays, a number of communes that have characteristics of digital barbarism are thriving because of the internet and other technological advancements.

Moreover, these dark web communes challenge the very
existence of property rights in intellectual property to foster various agendas and economic profiteering. In communes such as these, which three-dimensional (3D) printing or other elusive methods of appropriating intellectual property arguably belongs to, there is no law, order, or even the right to have property. For these un-organized communes, property rights are an antithetical to the spread of un-organized communes common property, for which there exists a belief to a natural right to appropriate intellectual property.

The following are simultaneous challenges that confront intellectual property rights on a daily basis: (1) how to respond to the un-organized communes that infringe intellectual property, and (2) finding new ways to demonstrate that one of the basic justifications of intellectual property is based on property rights theories.

It is commonly held that intellectual property is justified by a number of ways. The justifications for intellectual property may include utilitarian views that advance the economic maximization of returns, the property rights dimensions, and the pluralistic principle of intellectual property. However, these justifications of intellectual property are only applicable in a civilized society that respects property rights with a functional free market system and untethered opportunities to engage in digital trade. On the other hand, for un-organized communes, the justificatory theories for intellectual property do not exist; rather, the operating principle of un-organized communes common property allows for the free distribution and appropriation of know-how and creativity that are usually claimed under rules for property rights in a civilized society.

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8 ROBERT P. MERGES, JUSTIFYING INTELLECTUAL PROPERTY 2 (2011).
9 Id. at 12.
10 Id. at 235.
society. Unlike in a civilized society where judicial and enforcement powers exist, no such institutions are present in unorganized communes. As such, the appropriation and distribution of intellectual property goods creates a culture of wrong natural right, where barbarians seek refuge in the laws of the civilized society to protect them from what are seen as unfair market activities in intellectual property goods by economic producers in a civilized society. In other words, if intellectual property is proportionately distributed among firms, and such firms exclude other sections of the society to the firm’s intellectual property goods, then for barbarians there is a human right to those intellectual property goods of the firm. A similar situation developed in a South African case where human rights, as enshrined in constitutional principle, arguments for access to medicine were raised as part of the core legal justifications used by supporters of rival pharmaceutical companies to produce generic medicines based on soon to be expired patents.

Members of un-organized communes also arm themselves with the cloak of freedom of expression or fundamental rights on a number of occasions to justify their appropriation of copyrighted goods. This, of course, raises an interesting question, can a member of an un-organized commune with a web portal promoting and hosting copyrighted material make a human rights claim to such illicit activity? This was the situation when principals of the internet infringing site The Pirate Bay were brought before the European Court of Human Rights (“ECtHR”), and they claimed that they were merely exercising their freedom of expression guaranteed by law. Although their case was dismissed by the court, what the case highlighted, was the actual boundaries between copyrights, other fundamental rights, and the

14 See also, Ghappour, supra note 5, at 1079 (discussing network investigative techniques).
15 Cipla Medpro Ltd. v. Aventis Pharma 2012 No. 139 SA 1 (ZASC), ¶ 44 (S Afr.).
right to infringe in un-organized communes.\textsuperscript{18}

Although the human rights argument has been mostly used as a defense technique by a few barbarians in the un-organized commune, the courts on some occasions have suggested that intellectual property owners are also entitled to a human right defense of their property.\textsuperscript{19} This was the issue in a trademark case where the European Court of Human Rights invoked the need for human rights in property covering trademarks.\textsuperscript{20} Of course, the broader question that these examples of exploitation by both individual barbarians and corporate property owners of intellectual property demonstrate is the intersection of human rights and intellectual property.\textsuperscript{21}

It is not the purpose of this article to address that specific question. The above examples are demonstrative of the intellectual property regimes and how un-organized communes (intellectual property infringers) trespass property rights. Moreover, the trespassing of property rights is prevalent and difficult to navigate in areas of disruptive technologies and intellectual property, or for claims to the right to medicine.\textsuperscript{22} It is against this background that this article explores the nature of three-dimensional printing (3D)—the art of using machines to “turn a blue-print into a physical object”\textsuperscript{23}—for commercial purposes and its relation to property rights against the doctrine of post-sale confusion in trademark law. This narrow scope allows for better discourse providing greater insight into the property rights regime and new technological goods, based on 3D printing from the perspective of legal doctrines in trademarks.

2. Post-sale confusion and 3D printing: a legal primer

Post-sale confusion is a trademark confusion doctrine that

\textsuperscript{18} Id.
\textsuperscript{21} See Id. at ¶¶ 1, 3, 13.
signals to potential consumers the inferiority of products that are likely to damage the reputation of trademark owners.\textsuperscript{24} This confusion generally occurs after the goods have been bought and may cause confusion on potential consumers.\textsuperscript{25} Trademark confusion occurs when the similarity of the marks is likely to confuse the general public, and post-sale confusion “can occur when a manufacturer of knockoff goods offers consumers a cheap knockoff copy of the original manufacturer’s more expensive product, thus allowing a buyer to acquire the prestige of owning what appears to be the more expensive product.”\textsuperscript{26} This analysis is only one way of understanding post-sale confusion, as the actual meaning has evolved over time and, nowadays, post-sale confusion is understood as confusion that occurs after the point of sale.\textsuperscript{27} In other words, for post-sale confusion to occur, the potential customer must be confused after another customer has bought the goods.\textsuperscript{28}

To illustrate the meaning of post-sale confusion in the trademark context, consider, hypothetically, that Dr. Jekyll sees the Lab Assistant wearing a Serum watch he bought from a website under the mark “Serum” and decides to buy one for Mr. Hyde.\textsuperscript{29} Dr. Jekyll, however, was not aware that: (a) it wasn’t a genuine Serum, and (b) that the Serum watch was printed by three-dimensional (“3D”) technology. In this circumstance, Dr. Jekyll was confused on the quality of the Serum watch on two occasions. The first, and hence post-sale confusion, was when he saw the Serum watch that was worn by the Lab Assistant.\textsuperscript{30} The

\begin{footnotesize}
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\item \textsuperscript{24} Connie D. Powell, \textit{We all Know it’s a Knock Off - Re-Evaluating the Need for the Post-Sale Confusion Doctrine in Trademark Law}, 14 N.C. J.L. & TECH. 1, 24 (2012).
\item \textsuperscript{25} See generally Kal Raustiala and Christopher Springman, \textit{Rethinking Post-Sale Confusion}, 108 TRADEMARK REP. 881, 888 (2018) (setting out the sequences for which post-sale confusion may occur, and noting: “for post-sale confusion to occur, the observer must wrongly infer the source.”)
\item \textsuperscript{26} See Hermes Int’l v. Lederer de Paris Fifth Ave., 219 F.3d 104, 108 (2d Cir. 2000).
\item \textsuperscript{28} \textit{Id.} at 59; see also Lois Sportswear, USA, Inc. v. Levi Strauss & Co., 799 F.2d 867 (1986).
\item \textsuperscript{29} This hypothetical scenario of “Dr Jekyll” and “Mr Hyde” is for demonstrative purposes only.
\item \textsuperscript{30} See generally Morris, \textit{supra} note 27 (explaining what is post-sale confusion); Lois Sportswear, USA, Inc. v. Levi Strauss & Co., 799 F.2d 867, 873 (1986) (outlining the occurrence of post-sale confusion).
\end{enumerate}
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second was when he bought the same Serum watch only to recognize that it was not a genuine Serum. There are many other concerns for trademark law in this basic example, so I will stick to the notion of post-sale confusion to make the discussion more manageable. In the real world, similar situations occur daily where various products printed by 3D technology, or are simply replicas and counterfeit goods, are sold. When the courts are confronted with post-sale confusion because of replicas or counterfeits sold from various websites (or other channels), there is consensus that even if there is a notice to inform the potential consumer the goods are not those of the original trademark owners, such a notice “does not exclude the likelihood of post-sale confusion,” as highlighted in cases such as *Cartier*. For consumers and trademark owners, post-sale confusion is harmful when the market for 3D printed goods are in abundance and negatively impact the sales of the original goods protected by trademarks. Moreover, consumer welfare declines because the market for 3D printed goods presents a lack of confidence in buying the original goods. Hence, for trademarks owners they have to rely on provisions in trademark law that protect against post-sale confusion.

The purpose of a trademark is to signal quality and origin of goods to consumers and thereby reduce consumer search costs by acting as communicative devices. Trademarks also have another function: to protect the investment and property rights of good


33 *Morris, supra* note 27, at 47 (citing *Hermès Int’l. v. Lederer de Paris Fifth Ave., Inc.*, 219 F.3d 104, 108 (2d Cir. 2000)).

34 *Id.*

35 *Morris, supra* note 27, at 10-11 (citing 2008 O.J. (L. 299) art. 5(1)(b)); Lois Sportswear, USA, Inc. v. Levi Strauss & Co., 799 F.2d 867, 872 (1986) (“. . . it is equally clear that post-sale confusion as to source is actionable under the Lanham Act”).

36 *See* Ty Inc. v. Perryman, 306 F.3d 509, 510 (7th Cir. 2002) (“The fundamental purpose of a trademark is to reduce consumer search costs by providing a concise and unequivocal identifier of the particular source of particular goods.”).
Trademark laws are a response to these functions in that trademark law provides protection for trademark owners who are manufacturers of goods, and at the same time, trademark laws are able to offer protection to consumers. In Europe, there is a European wide Trademark Directive that protects consumers and trademark owners alike. In other jurisdictions, such as the United States, the Lanham Act provides protection for trademark owners and consumers. Under these legislations, trademark owners can initiate litigation against alleged trademark infringement. For example, under the Lanham Act a trademark owner must demonstrate that his trademark has met the criteria “used in commerce,” and that the alleged infringing good is likely to cause confusion among consumers. Based on these provisions of the Lanham Act, the likelihood of confusion is the main harm that must be demonstrated by the trademark owner. The US courts generally apply the Polaroid test to determine the likelihood of confusion.

In Polaroid, a Second Circuit court argued that eight factors must be considered to determine likelihood of confusion:

- the strength of his mark, the degree of similarity between the two marks, the proximity of the products, the likelihood that the prior owner will bridge the gap, actual confusion, and the reciprocal of defendant’s good faith in adopting its own mark, the quality of defendant’s product, and the sophistication of the buyers.

These tests for the likelihood of confusion are the fundamental

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37 See Case C-323/09, Interflora Inc. and Interflora British Unit v. Marks and Spencer Plc and Flowers Direct Online Ltd., 2011 E.C.R. I, 173, ¶ 61 (discussing the investment function of a trademark).
38 Morris, supra note 27, at 48.
41 Id., at (1)(a)-(b).
42 See Directive (EU) 2015/2436, supra note 39; see also id. at § 1114 (explaining that trademark owners have the right to initiate litigation for alleged infringement).
44 Id.
45 See generally, Polaroid Corp. v. Polarad Elecs., 287 F.2d 492 (2d Cir. 1961).
46 Id. at 495.
47 Id. (emphasis added).
elements American courts rely on for trademark cases.\textsuperscript{48} The \textit{Polaroid} tests are, however, a set of complicated yardsticks where each element must, from both the legal and often economic perspectives, be thoroughly developed and proven in litigation.\textsuperscript{49}

In the EU, the concept of likelihood of confusion is more elusive than in US trademark law because there is no legal definition of the term confusion.\textsuperscript{50} However, according to Article 8(b) of the EU \textit{Trademark Directive}, a trademark may be declared invalid if “the earlier trademark had not yet become sufficiently distinctive to support a finding of likelihood of confusion.”\textsuperscript{51} Furthermore, according to Article 5(1)(b) grounds for refusal of a trademark include, inter alia:

\begin{quote}
    because of its identity with, or similarity to, the earlier trademark and the identity or similarity of the goods or services covered by the trademarks, there exists a likelihood of confusion on the part of the public; the \textit{likelihood of confusion} includes the \textit{likelihood of association} with the earlier trademark.\textsuperscript{52}
\end{quote}

From this provision in the EU \textit{Trademark Directive} it is shown there are two grounds for legal actions by trademark owners, (1) the likelihood of confusion and (2) the likelihood of association.\textsuperscript{53}

One notable case in European trademark jurisprudence where the concept of the likelihood of confusion as developed in the Court of Justice European Union (“CJEU”) sent mixed signals to the lower courts (national higher courts in a member state) involved litigation over chocolate bunnies and a 3D trademark by rival

\begin{footnotes}
\item[49] Id. at 872 (“The Polaroid factors serve as a useful guide through a difficult quagmire”).
\item[50] See Case C-323/09, Interflora Inc. and Interflora British Unit v. Marks and Spencer Plc and Flowers Direct Online Ltd., 2011 E.C.R. I, 173, ¶ 36 (discussing the likelihood of confusion); see also Illanah S. Fhima and Catrina Denvir, \textit{An Empirical Analysis of the Liklihood of Confusion in European Trade Mark Law}, 46 IIIC 310 (2015).
\item[51] Directive 2015/2436, art. 8(b).
\item[52] Directive 2015/2436, art. 5(1)(b) (emphasis added).
\end{footnotes}
In *Chocoladefabriken*, the CJEU dismissed concerns that the defendant’s gold chocolate bunny was confusingly similar to the claimants. Instead, the Court concluded there was no bad faith when the claimant applied for trademark registration in the territory (Austria) where the defendant sold its own gold chocolate bunnies. This finding was contradictory to the ruling of the Austrian Supreme Court which found a likelihood of confusion between the two gold chocolate bunnies. Furthermore, the two concepts of confusion—likelihood of confusion and likelihood of association—were given different treatment by the CJEU’s decision and the earlier opinion of the Advocate General. For those who are unsatisfied with how the CJEU handled the ruling on likelihood of confusion and likelihood of association, a number of other cases in the Court’s jurisprudence have addressed these two concepts. Under the European trademark law deal, it is settled case law in the area of the likelihood of confusion with situations where, for example, members of the public confuses the conflicting trademarks, or that the conflicting trademarks are economically linked (likelihood of association).

Moreover, a further condition for the likelihood of confusion can be found in Article 8(1)(b) of the Trademark Regulation where the identity and similarity of the goods and services are established. The identity and similarity grounds for the likelihood of confusion has been confirmed in several cases and similar to the Polaroid

54 *See* Case C-529/07, Chocoladefabriken Lindt & Sprungli AG v. Franz Hauswirth GmbH, 2009 E.C.R. 1-04893 [hereinafter “Lindt” or “Chocolate Bunnies”].
55 *Id.*
56 *Id.* at ¶¶ 48-50; *see also* Opinion Advocate General, ¶ 64, ¶¶ 75-76.
57 *Id.* at ¶ 53; *see also* Opinion Advocate General, ¶ 75.
58 *Id.* at ¶ 15 (“In the opinion of the referring court, there is a likelihood of confusion”).
59 *Id.* at ¶ 16; *see also* Opinion of Advocate General, ¶ 71, 73.
61 Case C-323/09, Interflora Inc. and Interflora British Unit v. Marks and Spencer Plc and Flowers Direct Online Ltd., 2011 E.C.R. 173, at ¶ 96.
63 2009 O.J (L 78) art. 8(1)(b).
64 Case C-487/07, L’Oréal SA, Lancôme Parfums et al. v. Bellure et al., 2009 E.C.R. 90, at ¶ 50; Case C-533/06, O2 Holdings Ltd v. Hutchison 3G UK Ltd., 2008 E.C.R. 2008, at ¶ 47.
eight factor test in the US, the European Court also developed a
test where a number of factors are to be taken into account. The
similarity test which may determine likelihood of confusion in
Europe requires: “their nature, their end users and their method of
use and whether they are in competition with each other or are
complementary.” Additionally,
the essential function of the trademark is to guarantee the identity
of the origin of the marketed product to the consumer or end user by
enabling him, without the possibility of confusion, to distinguish the
product or serve from others which have another origin. For the
trade mark to be able to fulfil its essential role in the system of
undistorted competition which the Treaty seeks to establish, it must
offer a guarantee that all the goods or services bearing it have
originated under the control of a single undertaking which is
responsible for their quality.

In addition to these sample cases on the likelihood of confusion
in the European trademark system, empirical evidence has also
shown that both the similarity of marks and similarity of goods
“favoured confusion.” Thus, it is equally important to establish
that confusion take place and therefore causes harm before
demonstrating downstream confusion such as post-sale confusion.
Proving confusion is still a complex issue and as some
commentators have pointed out “the path that leads from
confusion to harm is more winding in the post-sale context” and
as such, in trademark confusion cases, it will always require
sufficient evidence to establish harm by post-sale confusion.

Thus, based on these observations and also the case law
interpretations of the likelihood of confusion, an assessment of
post-sale confusion can be made.

In the gold chocolate litigation case mentioned above, the
similarity of the marks that can cause the likelihood of confusion
are shown in Figures 1 and 2 below:

Figure 1: Claimant’s gold chocolate bunny.

65 Case C-39/97, Canon Kabushiki Kaisha, Japan v. Metro-Goldwyn-
66 Id. (emphasis added).
67 Id. at ¶ 28 (emphasis added).
68 Fhima and Denvir supra note 50, at 322.
69 See Raustila and Springman, supra note 25, at 893.
70 Case C-529/07, Chocoladefabriken Lindt & Sprungli AG v. Franz
71 Id. at ¶ 12.
Figure 2: Defendant’s gold chocolate bunny.\textsuperscript{72}

(For the purposes of the untrained eyes – the legal differences are the “bell” attached to the claimant’s bunny, gold-coloured covering, a red ribbon along with the visible mark “Lindt GOLDHASE” in brown lettering”, whilst the defendant’s mark is attached underneath).\textsuperscript{73}

For the purposes of post-sale confusion, now, assume, that in my hypothetical case,\textsuperscript{74} Mr Hyde had seen both bunnies with Dr. Jekyll’s lab assistant, who incidentally bought them from a website not related to either the defendant or the claimant and he would like to buy both. The alleged website in question also presumably used 3D technology to manufacture the bunnies, and

\textsuperscript{72} Id. at ¶ 14.
\textsuperscript{73} Id. at ¶ 16.
\textsuperscript{74} See supra note 29.
thereby implies that they are the genuine bunnies belonging to the claimant and the defendant. Mr Hyde encountered confusion prior to buying the bunnies when he saw them with the Lab Assistant and post-sale confusion at a later stage when he recognised that they were not the genuine bunnies because they were manufactured with 3D technology.

The issue for post-sale confusion in this example is to demonstrate that the gold chocolate bunnies were somehow *illegally manufactured* by the website using 3D printing technology, and therefore counts as trademark infringement. Thus, even if the lab assistant (the actual consumer), was unaware of the origin of the gold chocolate bunnies when the order was placed on the website, potential consumers (members of the public) such as Mr Hyde are likely to be misled when the gold chocolate bunnies are seen with the lab assistant.

One of the fundamental questions that has not been addressed in situations such as the hypothetical outlined above is the fact that the questions on the actual property rights are not discussed. Trademark owners, as seen in cases such as *Lindt*, are concerned about the actual infringement of their marks or the likelihood of confusion based on the similarity of the marks. However, a more fundamental question is hidden: to what extent are property rights present in 3D printed goods, and who are the legitimate owners of such property rights? In other words, does the claimant or the defendant own the property rights in the 3D printed gold bunnies that the hypothetical lab assistant bought from the website that caused Mr. Hyde to suffer from a bout of post-sale confusion? The next section explores the nature of property rights systems in trademarks and attempt to provide some answers to that very question.

### 3. Trademarks as property rights

Private property rights are one of the most fundamental institution of Western democratic societies, and its evolution bound the world together. Over the centuries, philosophical and
political thought have debated and questioned the nature of property rights, and the general consensus is property rights are essential to wealth creation and the rules governing the ownership of wealth.\textsuperscript{78}

From the classical Lockean approach to property\textsuperscript{79} to the modern utilitarianism analysis of property rights,\textsuperscript{80} the importance of this \textit{natural right} shaped the contours of economic development in nation states.\textsuperscript{81} The natural rights approach to property based on the Lockean labour theory, among other things, essentially stipulate that, it is expected that man can enjoy the fruits of his labour given that “every man has a property in his own person.”\textsuperscript{82} This is the so-called labour theory based on the Lockean doctrine and it widely applied to intellectual property rights.\textsuperscript{83}

The Lockean approach has been essential in justifying intellectual property for two reasons: (1) the Lockean labour theory espouses liberal economic values,\textsuperscript{84} and (2) utilitarian justifications of intellectual property have failed to come up with convincing empirical evidence.\textsuperscript{85} Thus, the philosophical analysis of property rights by scholars have always maintained a Lockean unison by building upon Locke’s early forecast of property rights.\textsuperscript{86}

One of the critiques of the Lockean approach to property rights was that it was too archaic and did not fit the modern realities of twentieth century trade and commerce, where economic gains are the natural objectives of these developments.\textsuperscript{87} Against this background, property rights underwent a reformation, cleansed of

\textsuperscript{78} See Polly J. Price, Property Rights: Rights and Liberties under the Law 42 (2003).
\textsuperscript{79} See generally John Locke, Two Treatises of Government (George Routledge And Sons 2nd ed. 1887) (1690).
\textsuperscript{80} See Gregory S. Alexander & Eduardo M. Penalver, An Introduction to Property Theory 11-13 (2012).
\textsuperscript{81} Id. at 95-105.
\textsuperscript{82} Locke, supra note 79, at 204.
\textsuperscript{83} See Dibble, supra note 7, at 75 (discussing the link of Locke’s labor theory to intellectual property”).
\textsuperscript{84} See e.g., John Rawls, Justice as Fairness: A Restatement 46 (Erin Kelly ed., 2001).
\textsuperscript{85} See generally Merges, supra note 8.
\textsuperscript{87} Hamilton, supra note 86, at 874.
its Lockean soul, and renewed in utilitarian form based on legal and economic justifications.\textsuperscript{88}

The utilitarian soul of property rights has been spread through the gospel of law and economic scholars about the welfare gains of property in that property are a bundle of legal sticks, promoting the needs of society.\textsuperscript{89} In this new testament of property, there was no need for old testament natural rights to property.\textsuperscript{90} Law and economics disciples such as Coase\textsuperscript{91}, Demsetz\textsuperscript{92}, and Posner\textsuperscript{93} 	extit{preached} that transaction costs in property rights were modern grundnorms. Thus, throughout the latter part of the twentieth century and continuing to this day, law and economic analysis of property rights remain the leading utilitarian justification of property.\textsuperscript{94}

The law and economic approach to property rights resonates with intellectual property, and the various rights regimes became a testing ground for the defence of patents, copyrights, and trademarks.\textsuperscript{95} According to Landes and Posner, trademarks for instance, promote economic efficiency.\textsuperscript{96} Only few scholars were still dedicating the Lockean analysis to intellectual property

\textsuperscript{88} Id.
\textsuperscript{89} See Terry Anderson & Fred McChesney, Property Rights – Cooperation, Conflict, and Law 1 (2003).
\textsuperscript{90} See id., at 14 (explaining that ancient philosopher theories do not apply today).
\textsuperscript{91} See Ronald Coase, The Problem of Social Cost, 3 J. L. & Econ. 1, (1960).
\textsuperscript{92} See Harold Demsetz, Toward a Theory of Property Rights, 57 The Am. Econ. Rev. 347 (1967).
\textsuperscript{94} See In re Trade-Mark Cases, 100 U.S. 82, 94-95 (1879) (noting the importance of utilitarian incentive under trade mark law); George Wright, Fundamental Property Rights, 21 Val. U. L. Rev. 75 (1986); F. Scott Kieff, Property Rights and Property Rules for Commercializing Inventions, 85 Minn L. Rev. 697 (2001) (outlining how the American patent system is built upon economic incentives); Richard Posner, Utilitarianism, Economics, and Legal Theory, 8 J. Legal Stud. 103 (1979); Thomas Merrill and Henry Smith, The Morality of Property, 48 WM & M. L. Rev. 1849 (2007) (arguing that morality is significant for the existence of property rights).
during the heights of the great property law and economic reformation. Yet, it was dissent among the ranks of the law and economics movement in relation to intellectual property that the utilitarian approach was dismissed for the lack of empirical evidence. The return to Lockean approaches to justify intellectual property in the technologically advanced twenty-first century came with a caveat: there was room for multiple approaches—a pluralistic domain. In this epic battle among the approaches to property rights, the trademark regime of intellectual property found itself confronted by moral, positivism, normativism, and utilitarian ideals.

Based on the modern functions of trademarks - to signal original source and quality - there is no doubt that property rights notions are part of this function. A justification of property rights in trademarks from this perspective requires a choice between the utilitarian and classical Lockean property rights.

There is no doubt that Lockean natural property rights arguments, especially when interpreted in the context of the labour theory, fit the function of trademarks. However, Lockean labour theory for trademarks cannot capture the functions of trademark efficiently. Those functions are better captured in the economic efficiency rights theory of utilitarianism, in which societal gains are produced both for members of the public and for owners of trademarks. Although Merges has argued for a pluralistic approach to justify intellectual property, the weakness with Merges’s argument is that his focus was seen in the context of patents and copyrights per se, and not the trademark perspective. Hence, for Merges, although the utilitarian approach does not properly justify intellectual property because of the lack of empirical evidence, that argument, in my view, does not hold when it comes to trademarks.

Trademarks are efficient tools that drive competition in the

98 See Merges, supra note 8, at 2-4.
99 See Merges, supra note 8, at 12-13 (discussing pluralism in intellectual property).
100 See eg., Peter Drahos, A PHILOSOPHY OF INTELLECTUAL PROPERTY (1996).
101 See Dibble supra note 7, at 75 (discussing Lockean theory in an intellectual property context).
102 See generally, Merges, supra note 8.
market to create wealth maximisation.\textsuperscript{103} Moreover, because trademarks help reduce consumer search costs, producers are able to maintain quality on the market for consumers.\textsuperscript{104} For these reasons, property rights' natural justification of trademarks are a utilitarian approach based on a legal and economic analysis.\textsuperscript{105} Seen in the context of legal and economic approaches, property is effectively bundled rights, wherein property owners have exclusive possession.\textsuperscript{106} As bundled rights, property owners are able to exercise more rights—and in the context of the trademark examples in this narrative, rights to receive income from how they exploit their trademarks.\textsuperscript{107} Such exploitation is not limited, for example, to manage and reorder the shape of their gold chocolate bunnies as highlighted earlier,\textsuperscript{108} but includes rights to transfer or license their rights to “renters,” as well as rights to change or refrain from exploiting such rights.\textsuperscript{109}

Further, the modern markets in which various goods are present—including the form and origin of the goods such as digital goods or 3D-printed goods—extends the rights in trademarks to capture spill-over exploitation by rival economic producers.\textsuperscript{110} In


\textsuperscript{104} Ty Inc. v. Perryman, 306 F.3d 509, 510 (7th Cir. 2002) (“The fundamental purpose of a trademark is to reduce consumer search cost by providing a concise and unequivocal identifier of the particular source of particular goods”).

\textsuperscript{105} See \textit{Trademark Law}, supra note 96, at 267 – 270 (setting out the property rights paradigm for trademarks).


\textsuperscript{107} See K Mart Corp. v. Cartier, Inc., 485 U.S. 176, 185 – 186 (1988) (“Trademark Law, like contract law, confers private rights, which are themselves rights of exclusion. It grants the trademark owner a bundle of such rights . . . “).


\textsuperscript{109} See Mission Product Holdings, Inc. v. Tempnology, LLC, 139 S. Ct. 1652, 1658 (2019 (“The agreement gave Mission an exclusive license to distribute . . . “).

the Lindt example, the investments made by the claimants in their gold chocolate bunnies represents good will and value that may guarantee a flow of income. A rival producer of gold chocolate bunnies (such as that of the defendant’s) may enjoy the free opportunities to associate his gold chocolate bunnies with those of the claimants.

Although the claimant can bring charges against the defendant for trademark infringement in normal circumstances, the situation is not that easy when bringing charges against the manufacturers and owners of the website that produce and sell goods such as gold chocolate bunnies. This is especially more difficult if the goods in question are manufactured using 3D technology. The significant question as such becomes who is the actual owner of the property rights for instance in the 3D-printed gold chocolate bunnies. Since property entails the control of rights and resources under the law of a state exercising its public power, then in theory, could those members of an un-organized commune who view private property as a form of public good or a common possession be right? Or, to put it another way, is there property in stolen goods, or can freedom of expression be asserted to justify stolen goods? In this context, then arguably, the 3D-printed goods are the property of its owners—who manufacture and produce them. However, it might be that the claimant in an

112 Id., ¶ 52 ("The extent of that reputation might justify the applicant’s interest in ensuring a wider legal protection for his sign").
113 See id. at ¶ 26 (where the defendant argued that “the traditional grounds for refusal of registration do not apply, or where the relative grounds for refusal cannot be applied because no right to protection has been acquired”).
114 For example courts may not necessarily agree that a website that sells items are actually liable for trademark infringement see Case C-324/09, L’Oreal and Others v eBay International AG, ECLI:EU:C:2011:474, ¶ 124 (explaining that eBay cannot be held liable for trademark infringement); see Rideout, supra note 110, at 168-70 (demonstrating the various avenues available to manufacturers and website owners to evade trademark infringement suits).
115 See generally Rideout, supra note 110, at 163-64 (explaining the open source nature of 3D-printing); see also Case 40397/12, Neij and Sunde Kolmisoppi v. Sweden, 2013 Eur. Ct. H.R. (Sweden) p. 2 (asserting freedom of expression to copyright goods).
116 At least in the area of licensing even in the event of bankruptcy licensees “can continue to do whatever the license authorises”, see Mission Product Holdings, Inc. v. Tempnology, LLC, 139 S. Ct. 1652, 1663 (2019); see also, Daus, supra note 12 (discussing Gee v. CBS, Inc.,
infringement action against the owners of the 3D printed bunnies regarding the likelihood of confusion will not find much support under the current system of trademark law. This is because the 3D printed hypothetical gold bunnies emanated from new technology. In that regard claims on trademark infringement is still an evolving issue.\textsuperscript{117} Therefore, 3D printing goods that are likely to cause post-sale confusion under existing trademark law are a natural evolution of property rights in a technological age where the owners and manufacturers can invoke a \textit{natural right} claim to their possession as a result of their labour.\textsuperscript{118} Moreover, modern trademark law and policy is better aligned to various market conditions as a result of technology, current consumers, and trademark owners with other options for market interactions.\textsuperscript{119} In other words, trademark law needs to respond to new and emerging property rights for trademarks that exclude unorganized communes from reaping the economic benefits of the original trademark owner’s intellectual labour. 3D printed goods are not only likely to cause post-sale confusion, but also can be legitimately produced and redistributed by market conditions.\textsuperscript{120} The presence of other rules guarantees the freedom of competition on the market place.\textsuperscript{121} Additionally, the market creates a “spectrum of risks” that work in favour of economic producers, so much so, that it is the reward of the risks that determine the property rights of new goods (even if printed by 3D technology).\textsuperscript{122} A good analogy to this argument is perhaps that of generic drugs that are manufactured once their patents are expired. But, at the


\textsuperscript{120} Desai & Magliocca, \textit{supra} note 117, at 1712.

\textsuperscript{121} \textit{Id.} at 1718 (discussing the DMCA).

\textsuperscript{122} See \textit{e.g.} Gucci America, Inc., v. Guess?, Inc., 868 F. Supp. 2d 207, 216 (S.D.N.Y 2012 (Discussing the “mid-market lifestyle” versus “the haute couture”); see also Morris, \textit{supra} note 27.
same time, one must also consider the fact that the role of trademarks and their inherent rights of exclusivity diminish a competitive market, yet part of the innovation of 3D technology is that it may foster competition by creating a new area of property rights. It is that possibility on the emergence of a new classification of property rights that spurs my interest due to the rise of 3D technology and its intersection with trademark law. I now turn to those arguments.

4. Towards a theory of adjacent property rights in 3D printing

Since un-organized communes who are also the owners and users of 3D technology are in a position to exploit rival producers’ goods and thereby reap the economic spill overs, the question of property rights to 3D goods is therefore an unsettled issue of law. That is my proposition, and in that regard, I am positing that a new category of property rights is the solution – adjacent property rights. In short, adjacent property rights refers to property rights in items that are as a result of 3D technology even when such items infringe the intellectual property rights of the original item. Hence, adjacent property rights are rights possessed by the 3D innovators in an item that has intellectual property characteristics of an original item. Moreover, another claim I am making is that adjacent property rights can also coexist with the owners of the original item whose intellectual property rights have been infringed in creating a new 3D printed item (the coexistence thesis). Thus, adjacent property rights as a concept are adjacent to possession and ownership in property rights proper. I will explain these arguments against the context of current trademark law and 3D printing technology.

There is an emerging literature that in the broader context of

\[123 \text{See e.g. Grace, supra note 31.}\]
the intellectual property and trademark law sphere offers some provocative and/or interesting arguments on the dilemma and problem of post-sale confusion in 3D printing. For one scholar, the issue of post-sale confusion caused by inferior 3D printing “lessens the value of a trademark as an indicator of quality.” While I do endorse this prognosis, there is also another observation that can be added, and that is, the economic implications from lessening the quality in goods will also negatively affect downstream manufacturers and the economic dependency of goods produced by the original manufacturer.

Some critics may argue for stronger enforcement of intellectual property laws to address 3D infringement, which cannot alone solve the problem. In the case of trademark infringement and its relationship to 3D printing – it is an ever-complex problem. Trademark rights cover not only shapes, logos, and symbols, but also position, the marks and shape of goods; owners may find it difficult to enforce trademark infringement against a 3D printed version of their work, especially if visible trademark symbols are removed from the product when being sold. Furthermore, because there is difficulty in establishing the likelihood of confusion, particularly, post-sale confusion in trademark infringement cases, strict legal analysis by the courts will only result in subjective treatment of likelihood of confusion in 3D

125 See generally, Osborn supra note 118, at 865; Raustila & Springman, supra note 25.
126 See Ebrahim, supra note 118, at 30; but see also Neil Wilkof, Trademarks and Brands in the Competitive Landscape of the 3D Printing Ecosystem, 104 THE TRADEMARK REP. 817 (2014).
127 See Wilkof, id., at 818-20.
129 In Lindt, supra note 73, it was clear that the trademark was placed in a less visible area of the defendant’s item in order to disguise the difference with the claimant’s gold bunnies.
printed post-sale confusion litigations. Thus, if there is a more compelling argument to create adjacent property rights – then both the state and original intellectual property owners can benefit if such adjacent rights are financially sanctioned at the point of sale. Thus, the adjacent property right theory can work best in the trademark regime, given that trademark law generally grants property rights in trademark, mostly for an infinite timescale.

One general argument that most intellectual property lawyers often invoke to address the problem of 3D printing is that of contributory liability, where other actors are held potentially liable for infringing intellectual property rights. In the context of this article, and especially from the 3D printing perspective, the doctrine of contributory liability can be the absolute remedy (but that argument requires a separate article), and there is an economic cost if contributory liability is invoked. One segment of the “innovative society” can come to a halt, thereby creating, in a Posnerian sense, lessening the economic output with negative effects on the welfare of society.

To set in motion the theory of adjacent property rights in 3D printing, consider the two objects below in Figures 3 and 4, with an original trademark (Object 2), and generated new 3D printed property (Object 1).

Figure 3: Object 2 (original)

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131 Tiffany (NJ) Inc. v. eBay Inc., 600 F.3d 93, (2d Cir. 2010); Louis Vuitton Malletier, S.A. v. Akanoc Solutions, Inc., 658 F.3d 936, (9th Cir. 2011); Case C-324/09, L’Oreal and Others v eBay International AG, ECLI:EU:C:2011:474

132 See Tiffany (NJ) Inc. v. eBay, Inc., 600 F.3d 93, 107 (2d Cir. 2010) (“For contributory trademark infringement liability to lie, a service provider must have more than a general knowledge or reason to know that its service is being used to sell counterfeit good.”); Lucas Osborn, Regulating Three-Dimensional Printing: The Converging Worlds of Bits and Atoms, 51 SAN DIEGO L. REV. 553 (2014); William M. Landes & Richard A. Posner, A Positive Economic Analysis of Products Liability, 14 J. LEGAL STUD. 535, 554 n.22 (1985). [Hereinafter Positive Economic Analysis].

133 Positive Economic Analysis, supra note 132, at 563.

134 A 3-D Mark in Full Bloom at the High Court of Frankfurt, WOLTERS
Figure 4: Object 1 (3D printed model) (Photo Credit: Kai Schmidt-Hern)\textsuperscript{135}

\textsuperscript{135} Perfume - Perfume Marc Jacobs Daisy Women Eau De Toilette Marc Jacobs Eau De Parfum Spray, FAVPNG, https://favpng.com/png_view/perfume-perfume-marc-jacobs-daisy-
The above objects in Figures 3 and 4 can be interpreted in the illustration below (Figure 5), where Object 2 is represented by the CAD files with original property design and its subsequent result that leads to a new identical to Object 1, and hence, for my purposes, “adjacent property rights”.

![Figure 5: rendering an illustration of a new adjacent property right.](https://via.placeholder.com/150)

At different points in time the original property design and item is placed on the market. The various transactions that occur between the original intellectual property owner, consumers, and downstream manufacturers creates a market for the original item. An innovative downstream manufacturer equipped with 3D printing technology creates a new item for which he is the “owner” of the property rights in the new item. This new item, the 3D printed goods, and ownership of its property rights results in an adjacent property right because the original intellectual property is present in the new 3D printed goods. Moreover, the original intellectual property owner can also lay a claim to the new property by initiating infringement proceedings. However, the downstream 3D manufacturer can be liable for trademark infringement for having trespassed or appropriated the original property of the trademark owner. In order to avoid an interruption of the productivity process a new form of right, adjacent property rights, can be claimed by the original property owner. Thus, adjacent property rights are linked to the original property, that is, it is adjacent to the original intellectual property protection. This equates to the coexistence thesis I earlier mooted. The compensation process of adjacent property rights will however be levied by the state at the point of sale on the new property of the 3D printed goods. All forms of goods represent a type of property with economic value, and as such, are entitled to legal protection. The types of legal protection that may be taken vary. The original

women-eau-de-toilette-marc-jacobs-eau-de-parfum-spray-png/gYmZfJ3w (last visited Jan, 19 2020).
property, which an owner claims was infringed can be protected by trademark law or other forms of intellectual property law. However, because the new product—the 3D printed good—is also a form of property, the rights in it require legislators to take steps to protect such rights. Therefore, as a result of the adjacent rights in 3D printed goods, economic value, property rights, and trademark protection are all part of a process with distinctive characteristics that nevertheless embraced “rights” as necessary. Goods and objects created by 3D printing are property and therefore, given that the ownership of property is the driving force behind economic prosperity and the axis of innovation and creativity, governments will be required to take additional steps to protect new property rights while promoting existing property rights.

![Diagram](image)

**Figure 6:** Downstream manufacturer creating adjacent property rights in 3D printing.

The above diagram (Figure 6) illustrates how the 3D commercial user (un-organized commune) is able to benefit from the spill over of intellectual creativity of the original intellectual property owner, and then bundle that creativity in the necessary instructions (3D files) for the machine (3D printer), and by adding
the requisite material the process of printing (funnelisation) results in the replica of the original innovation that is protected by intellectual property rights. Even if the commercial user were to slightly manipulate the 3D files so that there was a slight variation to the end object, and thereby distinguishing the new object from that of the original intellectual property owner, then a confusingly similar product could still be actionable under trademark law.136

If the end object with the adjacent property rights contains a logo, design or the trademark of the original object and the commercial user removes that trademark to claim property rights to the new end object, he may still be liable under trademark law for infringement if the end object is similar or identical to the original, trademarked object.137 The mere removal of a logo alone does not prevent the application of trademark law and various tests for trademark infringement under the likelihood of confusion.138 A member of the consuming public who spots the end object without the logo and still recognizes other identifying features, such as design or product configuration, receives signals that the object is the product of the original intellectual property owner and will be further deceived. As such, the harm of post-sale confusion erodes the reputation of the original owner.139 Additionally, the economic benefits of the original property trademark owner will decline due to the “unauthorized production of products incorporating protected word marks, design marks, and trade dress via 3D printing.”140 Thus, when discussions about 3D printing and trademarks are raised it is worthwhile to look beyond the conception of a logo or sign and take into account other observable features of trademark.

Moreover, one must consider that adjacent property rights in 3D printed objects that arise from protected intellectual property rights create a market for valuable resources. Adjacent property rights must be seen within context of normal property rights, as

137 Id.
138 Id.
139 See generally Grace, supra note 31, at 263 (discussing post-sale confusion and trademark law).
140 Id. at 276.
any derivative work based on intellectual property infringement, are in fact, a form of “quasi property.” Thus, as property rights, adjacent property rights are legitimate instruments that can be entrenched with legal tools for the productive and economic development of society, but at the same time allow the original owners to invoke their right to compensation when trespassing and appropriation occurs.

Property rights are a complex set of legal relations that are driven by economic opportunities and transaction costs. The latter, transaction costs, include “the costs of establishing and maintaining (economic) property rights.” In other words, the presence of transaction costs in property rights is essential in how those rights are enforced and its definition in other adjacent property rights. As such, for downstream adjacent property rights in 3D printing, the illumination and delineation of such rights will also have to take into account the scope of transaction costs in the property rights of the original intellectual property.

The fundamental reason for the proposition of adjacent property rights in 3D printed goods is to lessen the disruption of the economic process in a society where innovation and enforcement of intellectual property rules occur. Where the original intellectual property owner is able to claim adjacent property rights, the production process in an economy may operate without interruptions so that the economic value on both the adjacent property rights and the original intellectual property rights are achieved. A further noteworthy attraction of adjacent property rights in the 3D printing manufacturing process is the natural right of trademark property rights. What this means is that rights in trademarks – unlike other rights in the intellectual property regime – are indefinite. In other words, trademarks are not expired (providing that they are in commercial use), as such, original manufacturers are in a better position to extract adjacent

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142 See Yanner v Eaton (1999) 201 (CLR) 351; see also Heller, supra note 2, at 417 (explaining that the legal scholarship on property rights relies on outdated approaches); Breakey supra note 2, at 573 (comparing “natural rights” in property); Menard, supra note 2, at 80; DOUGLAS W. ALLEN, TRANSACTION COSTS (Simon Fraser Univ., Dep’t of Econ. 1999).
143 ALLEN, supra note 151.
144 Alan Wood Steel Co. v. Watson, 150 F. Supp. 861, 862 (D.D.C. 1957) (“...a trademark becomes the permanent property of its owner and secures for him a monopoly in perpetuity”).
property rights from a downstream 3D printing manufacturing process that relies on the initial intellectual property rights to produce the 3D economic object.

While other intellectual property regimes, such as copyrights and patents, pose additional legal questions for 3D printing, the property or exclusive rights in those regimes ultimately expire.145 This is not the case with property rights in trademarks.146 From my perspective, trademarks represent a natural flow of the economic and innovation process that binds liberal markets to functions based on a number of factors. Those factors are embedded in how market oriented a society is, the level of economic development, the ability and flexibility of laws to respond to technological changes and the transactions costs associated with property rights.147 Thus, if property rights are in effect perpetually, they are essential to the state.148 However, since 3D printing is a challenge to traditional property rights like those found in patents and copyrights,149 perpetual economic advancement thus requires adjacent property rights to maintain the harmonious melody of economic innovation.

Another argument for the establishment of adjacent property rights in 3D printed goods and technology is the presence of multiple actors in the innovation and manufacturing process that must confront the multiple regimes in intellectual property.150 The number of actors with their various forms of ownership in intellectual property, coupled with the innovative and manufacturing process,151 requires restraint and compromise on the enforcement of intellectual property rules. From my position, an over enforcement of intellectual property rules can hinder the

145 For example, under US copyright law the protection lasts the life of the author and seventy years. 17 U.S.C. § 302(a).
147 See Yanner v Eaton (1999) 201 (CLR) 351; see also Heller, supra note 2, at 417 (explaining that the legal scholarship to property rights relies on outdated approaches); Breakey supra note 2, at 573 (comparing “natural rights” in property); Menard, supra note 2, at 80.
151 Id. at 185-186 (discussing additive manufacturing in Australia).
downstream 3D printing and manufacturing process, and thereby creates negative economic impact on society. Arguably, on the other hand, the application of adjacent property rights acknowledges the ownership of intellectual property of the original owners and the economic value of the 3D printing manufacturing process. As such, this compromise, can enable the development and flexibility of intellectual property norms based on multiple actors.\textsuperscript{152} In other words, there is a benefit, if more than one theory or application can justify the nature of intellectual property rules based on the existence of multiple actors.\textsuperscript{153} The latter point has been mooted before by Merges, who argued that intellectual property rights can be justified by the pluralistic state of innovation,\textsuperscript{154} and equally, in my view, pluralism can justify the existence of adjacent property rights in the 3D printing manufacturing process.

5. The necessity of adjacent property rights in 3D printing post-sale confusion

The protection of trademarks are determined by a number of factors that can be in conflict with desired goals of economic innovation.\textsuperscript{155} Where trademark protection is nearly infinite, the degree of innovation can be limited if reliance on new innovation includes engaging with existing trademarks.\textsuperscript{156} One conundrum of the functions of trademarks is that they must seek to foster competition and yet, at the same time, enforce their exclusive

\textsuperscript{152} But see Akamai Techs., Inc., v. Limelight Networks, Inc., 692 F.3d 1301, 1336 (Fed. Circ. 2012) (en banc) (recognising multiple parties in patent infringement).

\textsuperscript{153} See generally MERGES, supra note 8. at 325 (discussing pluralism in intellectual property).

\textsuperscript{154} Id.

\textsuperscript{155} But see Cases C-236/08 – 238/08, Google France v. Louis Vuitton Malletier SA, ECR – I-02417, ¶ 92 (discussing keywords prohibition in advertising). For helpful arguments on the innovation nexus; see e.g. Ansgar Ohly, Free Riding on the Repute of Trade Marks: Does Protection Generate Innovation?, in THE INNOVATION SOCIETY AND INTELLECTUAL PROPERTY (Josef Drexl and Anselm Sanders ,, eds, 2019); Sandro Mendonca, et al., Trademarks as an Indicator of Innovation and Industrial Change, 33 RES. POL’Y 1385 (2004); Dirk Crass and Franz Schwiebacher, The Importance of Trademark Protection for Product Differentiation and Innovation, 44 ECONOMIA E POLITICA INDUSTRIALE 199 (2017).

\textsuperscript{156} Google France, id. at ¶ 92.
property rights to maintain their reputation.\textsuperscript{157} Trademarks are not “public goods” per se, and their social and market value often raise barriers to entry by competitors.\textsuperscript{158} However, beyond the barriers to entry argument, another immediate concern is how the utilitarian doctrine in trademarks impacts modern 3D printing and post-sale confusion.

The utilitarian functionality\textsuperscript{159} in trademark protection requires features of a trademark to be “essential to the use or purpose of the article or if it affects the cost or quality of the article.”\textsuperscript{160} In other words, the functional characteristics of a product being represented by a trademark is equally important for it be successful.\textsuperscript{161}

Now, back to the perfumes illustrated in Figures 3 and 4 above. If in that example, the 3D printed perfume bottle infringes the original mark and the original owner invokes claims of post-sale confusion, trade dress, or design infringement, how does utilitarian functionality apply to the alleged infringer of the 3D printed luxury perfume bottle? Can he argue the original trademark owner creates barriers to competitive entry and that trademark protection allows the owner of the 3D printed perfume bottle exemption under the utilitarian function of trademarks? In other words, does the mixture of innovation laws such as patent protection and trademark protection shield him from alleged trademark infringement? Are the claims of trademark infringement only attempts to frustrate the legitimate efforts to produce an equivalent luxury perfume?

Some courts have forcefully defended the utilitarian features of trademarks arguing that they are not subjected to protection.\textsuperscript{162} In Kirkbi,\textsuperscript{163} regarding the alleged infringement of Lego’s building

\begin{footnotes}
\item[159] See generally Jill-Ann Ealy, Utilitarianism and Trademark Protection, 19 J. CONTEMP. LEGAL ISSUES 14 (2010); see also Robert G. Bone, Trademark Functionality Reexamined, 7 J. LEGAL ANALYSIS 183 (2015).
\item[161] Id. (citation omitted).
\item[162] In re Owens-Corning Fiberglas Corp., 774 F.2d 1116, 1120 (Fed. Cir. 1985) (citing In re Pollak Steel Co., 314 F.2d 566, (1963)).
\end{footnotes}
blocks, the Canadian Supreme Court ruled there were utilitarian features in Lego’s building blocks that could not be trademark protected. According to the ruling: “trade-mark law is not intended to prevent the competitive use of utilitarian features of products.” In this instance, an attempt was being made to use trademark laws to extend the exclusive rights that were granted under patent laws.

However, for the broader issue of utilitarian function, the inquiry is the necessity of 3D printed goods in effective competition. So, if 3D printed products (such as the 3D printed gold chocolate bunny bought by Dr. Jekyll, or the luxury perfume) are produced by independent innovators who exercise autonomy in a free market system, should their goods (new property) be subjected to trademark law? What if further post-sale confusion occurs on an un-assuming public by the examples of the 3D printed goods? Could the proposed theory of adjacent property rights be applicable? If so, is there a necessity of adjacent property rights in 3D printed goods post-sale confusion? The rest of this section contextualizes the latter question.

Assume 3D printed goods are part of the innovative process and not merely copycats freeriding on the trademark and good will of the original owner’s intellectual property. Surely, a certain degree of innovation is required during the making of the 3D printed goods (as illustrated in Figure 6). A fundamental question then, is at what stage are trademarks indicators of innovation or to what degree do they drive innovation in the 3D printing sector?

A majority of the studies that empirically examine trademarks and innovation do not look at the relation of 3D printing to innovation in the trademark context. Yet, clearly 3D printed goods were part of the innovative process and not merely copycats freeriding on the trademark and good will of the original owner’s intellectual property. Surely, a certain degree of innovation is required during the making of the 3D printed goods (as illustrated in Figure 6). A fundamental question then, is at what stage are trademarks indicators of innovation or to what degree do they drive innovation in the 3D printing sector?

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goods and activities are part of the innovative process in an economy, as demonstrated by the utilitarian features of trademarks with spillover effects in the 3D printing world. Moreover, modern trademark owners are increasingly expanding their brands and monopolization in order to maximize economic returns and financial rewards from innovation as a result of the good will their marks have created over time.  

Trademarks, goodwill, and economic incentives are attractive to rival producers to enter the market through freeriding and other property rights violations to increase their market share of new customers. The drawback for the original trademark owner is that while his rival enjoys a special advantage through the low cost selling of the new property (a 3D printed good) the creative and innovative process declines. Adjacent property rights are able to stem that decline where there are legal options available for financial sanctions at the point of sale for 3D manufactured goods that are as a result of free-riding on the original trademark owner’s creativity and goodwill. The utilitarian function is a sort of mid-way referee between trademark law and patent laws, and it is therefore an anchoring platform for the new theory of adjacent property rights in 3D printed goods, where there is a void between the original trademarked good and the new 3D printed goods.

Since it is difficult to claim the void in 3D printed goods by either existing patent or trademark laws, a new distinctive category of adjacent property rights can potentially maintain a system of financial rewards for the creators, innovators, and consumers. In general, property rights are a defense for “the value inherent in


171 See generally Smith, supra note 124.
172 See generally Trademark Law supra note 94; see also Dibble, supra note 7; see also MERGES, supra note 8, at 2-4.
stable ownership\(^1\text{74}\) but, given that 3D printing technology has now pierced the veil of property – the goal posts regarding the value of property now shift to multiple actors.\(^1\text{75}\) The rights that adjacent property in 3D printed goods represent include entitlements, and as Holcombe argues, people often claim rights to various intellectual property but are unable to enforce their claims.\(^1\text{76}\) Adjacent property rights can eliminate the need to enforce rights claims in 3D printed goods because there would be a need to impose a financial sanction at the point of sale.

The nature and context of 3D technology in general represents a complex challenge to intellectual property where there are instances of creation of rights in various aspects of the technology.\(^1\text{77}\) Design files necessary for the creation of 3D printed goods with alleged intellectual property infringement are by themselves a result of a creative process protected by copyright law.\(^1\text{78}\) Furthermore, there are various rights to design files that include software and business methods, and therefore the mere presence of alleged intellectual property infringement does not give the entire story of the creative and innovative process.\(^1\text{79}\) From my point of view, restrictive rights in 3D printed goods and creative process merely erects a temporary barrier to rights and thus, the rhetoric on the intellectual property and 3D printing process requires deeper analysis of property rights and how they can perpetuate the innovative process, rather than slowing it down.

Naturally, original intellectual property owners, justified or unjustified, favour a strict enforcement of intellectual property rules to stifle 3D printing technologies and goods.\(^1\text{80}\) This is with

\(^{174}\) Id.
\(^{178}\) I would imagine that to create 3D files requires some amount of “labour”, “creativity” and “design”, and, in that sense, forms part of the creative process, but see generally Depoorter, supra note 128; id.
\(^{179}\) See also Bechtold, supra note 176; Viola Elam, *CAD Files and European Design Law*, 7 JIPITEC 146 (2016).
\(^{180}\) L.T.C. HARM'S, *A CASEBOOK ON THE ENFORCEMENT OF INTELLECTUAL*
good reason, given that the current structure of economic utilitarian justification of intellectual property allows for a favourable outcome of the enforcement of intellectual property rules. Yet, at the same time, those utilitarian justifications can be extended to 3D technology and printed goods to create an additional justification of property rights – that are adjacent to their utilitarian justifications. A utilitarian justification of 3D printed goods and technology (both theoretically and practically) is necessary to protect consumers from post-sale confusion and from unnecessary economic transactions that can be averted with the presence of a financial sanction at the point of sale.

The necessity of adjacent property rights in 3D printing and post-sale confusion provides an important tool for flexibility in the restrictiveness of intellectual property rules that are justified in the language of property rights. Adjacent property rights in 3D printing goods are continuous and necessary for the expansion of economic progress in societies where property rights represent democratic and economic morals. A prime justification of adjacent property rights is that it removes the associated costs of enforcing intellectual property rights in 3D printed goods and maintain the constant flow of innovation and productivity. Traditional approaches to property rights have been more or less unchanged, the positive economic benefits of adjacent property rights will be seen as detrimental to the status quo. This should not be the case, because adjacent property rights such as those found in 3D printed goods are transitory.

The evolution of rights in intellectual property was a response to the new developments of their era, aided and abetted by positive legal relations. The property rights in trademarks are the “youngest” of the rights regime of intellectual property, and have only been recognized by law in the latter part of the eighteenth century. Given that innovators and creators have claimed rights to the creative and innovative objects based on the existence of laws that relate to rights as a claim and also claims to the objects, 3D printed goods are the “new intellectual property” of the modern


181 Id.
era, and only rights claim and claims to the object under legislative acts can guarantee such rights and claims. As such, adjacent property rights require the legislature to provide for the protection of a rights claim in an economic object from 3D printing with an original rights claim to intellectual property.

6. Conclusion

This article explored the nature of post-sale confusion from the context of 3D printing and the challenges for intellectual property rights and trademark protection. There should be a new approach or theory to property rights that covers the ownership and entitlements in goods that are a result of 3D printing process (at the commercial level) when they give rise to post-sale confusion. I labelled this approach “adjacent property rights” and argued this approach is needed to address some of the challenges for modern infringement and rights claims. Adjacent property rights are adjacent to possession and ownership in property rights rhetoric but more importantly, adjacent property rights links the 3D innovators to claim rights in their 3D objects, but at the same time allows for the original rights owner to claim adjacent property rights as a coexisting right in relation to the infringed object. Since there is a void created between the 3D printing process of goods due to reliance on the original protected goods, its intellectual goodwill, and, the outcome of the new printed goods, there is opportunity for the resulted goods to be covered by adjacent property rights. That way, both the original rights owner and the 3D goods creator can claim protection of “property rights” under state laws for their economic rights and innovative autonomy.

Contemporary innovation requires the legal rules that represent property rights ought to be flexible in order to maintain efficiency and the wheels of innovation. Most of the theoretical works on property rights have built upon the sequence of ideas from Locke to Rawls. Works in intellectual property have not departed from the same logic of thought on property rights as propositioned by

184 See Smith, supra note 124, at 106-7; Wesley Newcomb Hohfeld, Some Fundamental Legal Conceptions as Applied in Judicial Reasoning, 23 Yale L.J. 16 (1913) (discussing rights claims).
186 See Merges, supra note 8, at 12-13.
classical liberalism. As such, the basic structure of society and associated innovations have relied on the grundnorms of Lockean property rights to justify their existence. However, the same process that led to the rights in ideas and innovation as the “new property” of intellectual property in the nineteenth century can be applied to the new property of 3D printed goods in the twenty first century to justify adjacent property rights.

The problem with intellectual property rules in general is that they are either under-inclusive or over-inclusive and do not represent the compromise ground of spill over innovation. This issue is where adjacent property rights in 3D printed goods come in, filling in the void in the innovation process by recognizing that void as adjacent to the rights that claimants and defendants tussle over in a court of law regarding innovation in the twenty-first century and the relevance of 3D printing. Moreover, it is quite possible for adjacent property rights as a concept to be seen as adjacent to possession and ownership in property rights proper. Nevertheless, based on the proposition in this article, adjacent property rights should be able to de-toxifies the litigation process and maintain the flow of innovation that enable various members of society to gain financial benefits. The state has a role to play with the imposition of financial sanctions for the claims under adjacent property rights.

The discussion in this article should be viewed as an effort to promote the value of property rights that all economic participants in society claim regarding their intellectual and creative innovations. Adjacent property rights can therefore eliminate the need to stifle the innovative and creative process while also including original property owners to a part of the downstream spill over from a rational value perspective. In the early days when the internet became the most important channel for the development of cybernetic technologies, such as file-sharing or streaming services for music, one of the most frequent arguments was that cybernetic technologies such as the MP3 file system, or the peer to peer file system, would reduce the sale of music and create harm for copyright holders. However, such fears were not

187 See id. at 18.
188 Id. at 8.
189 See generally, Desai & Magliocca, supra note 117 (discussing Napster); Akester & Lima, supra note 190, at 573-74; Mark Patterson, Innovation in Complementary Internet Markets, 74 FORDHAM L. REV. 639 (2005); Philip Weiser, The Internet, Innovation, and Intellectual
fully justified, as cybernetic technologies also allowed music producers and copyright owners to embrace various methods to deliver music on the internet to consumers.\textsuperscript{190}

In a recent study the European Commission also found that there is little or no economic effect from internet piracy.\textsuperscript{191} This is one of the alleged fears that adjacent property rights can also address by building bridges to intellectual property owners to embrace the value and opportunity that spill overs in the innovative and creative industries provide. Perhaps more significant however, is the role of the state in adjacent property rights.

As legislators, there is an onus on states to provide guidance to courts and economic participants in society on how much technological challenges are influencing the fair and competitive spirit of free markets, and to maintain economic innovation and the welfare of society. Adjacent property rights can help to minimize the over-inclusiveness and under-inclusiveness of intellectual property. Furthermore, as Holcombe argues,\textsuperscript{192} the government can grant and enforce rights, as long as those who are seeking the rights “are able to compensate the government,” and, in the theory this article proposes, the government can recover compensation from adjacent property rights at the point of sale (to also benefit the original rights holders).

The solution to intellectual property problems in 3D printing requires flexible adaptation of property rights that are found in other parts of the innovative and creative industries. A flexible adaptation of property rights means embracing the primary function of property rights – to maintain a free, fair and democratic society with economic spill overs. These functions of property rights are also important for the new economy that challenges the strict interpretation of intellectual property laws given that the new economy produces goods and services with adjacent property rights.

The final words are reserved for the central characters and

\textsuperscript{191} See \textit{EUROPEAN COMMISSION STUDY, ESTIMATING DISPLACEMENT RATES OF COPYRIGHTED CONTENT IN THE EU}, \textit{EUROPEAN COMMISSION 7-8} (2014).
\textsuperscript{192} Holcombe, supra note 185, at 489.
objects in this article. As has shown above, Dr. Jekyll, Mr. Hyde, the Lab Assistant, and consumers of luxury perfumes – all got embroiled in a world where the proliferation of 3D printed goods are rampant and cause headaches for trademark owners due to post-sale confusion of luxury perfumes, watches and gold-encased chocolate bunnies. Furthermore, not only are intellectual property infringements a notorious activity on the internet, but they are also difficult to police and enforce as “property rights,” and thereby cause economic loss for claimants, defendants, innovators, creators, and the general public.\textsuperscript{193} In this chaotic world of uncertainty and post-sale confusion in 3D printed goods with various harms and benefits, could the boundaries of property be remedied by the existing system of property rights, or could the proposition of adjacent property rights be the ultimate solution?

There is a legitimate case, that, in the light of these challenges, an alternate system of property rights, that are, property rights in the original context, be relied upon to solve the paradox of adjacent property rights found in 3D printed goods.\textsuperscript{194} This is because, property rights are essential to the functions of a liberal market economy\textsuperscript{195} and only an extension of those rights to 3D printed goods can help to determine how the void between original intellectual property goods and the new 3D printed goods can be resolved and protected.

\textsuperscript{193} See Smith, supra note 124, at 90 – 100; Akester & Lima, supra note 190, at 573-75.

\textsuperscript{194} See also, Lucas Osborn, Regulating Three-Dimensional Printing: The Converging Worlds of Bits and Atoms, 51 SAN DIEGO L. REV. 553, 593 – 606 (2014) (discussing some of the regulatory challenges for 3D printing).

\textsuperscript{195} See MERGES, supra note 8, at 13, 16.