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## The Role of Digital Products Under the WTO: A New Framework for GATT and GATS Classification

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# The Role of Digital Products Under the WTO: A New Framework for GATT and GATS Classification

Sam Fleuter\*

## Abstract

*This Comment provides a new system of classifying digital products as goods or services under international trade law. Under the General Agreement on Tariffs and Trade (GATT), WTO member states have limited power to impose protectionist measures on the importation of goods. Under the General Agreement on Trade in Services (GATS), states face similar limitations on their ability to restrict international trade in services. But GATS only applies if states opt in, meaning that countries can choose which services are subject to trade liberalization. Within the GATT-GATS framework, digital products are notoriously difficult to classify because they possess traditional characteristics of both goods and services. Though this Comment applies to different types of digital products, it focuses on the international trade of 3D renderings used for additive manufacturing, as this is a type of digital product that has not received any attention in international trade literature. This Comment proposes a three-part taxonomy for distinguishing digital goods from digital services. To distinguish goods from services, I first look at formalistic definitions of good and services. Next, I look at practical concerns of consistency across international trade. Finally, I investigate the underlying goals of the WTO to identify which classification best suits digital products. I conclude that digital products should be treated as services and therefore be governed by the GATS.*

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## I. INTRODUCTION

According to Moore's Law, the number of transistors that electrical engineers will be able to fit on a microchip doubles every two years.<sup>1</sup> So while technology expands at a geometric rate, the law governing technology inevitably loses pace and has the difficult task of playing catch-up. In international law, this problem has manifested itself in the realm of international trade of digital products. International trade law under the World Trade Organization (WTO) relies on distinguishing between goods and services. In the age of the Internet, commenters have vigorously debated the proper WTO treatment of digital products—are they goods or services?<sup>2</sup> This Comment seeks to answer that question by proposing a new, three-part taxonomy for classification. Section II explains the relevant aspects of WTO law and outlines the difference in treatment of goods and services in international law. Section III discusses four types of digital goods and the efforts made at classification thus far. Section IV provides a three-part taxonomy of classification based on formalistic, practical, and theoretical concerns. Finally, Section V proposes a method to synthesize different methods of classification. Applying this method, I conclude that digital products should be treated as services under current WTO law.

## II. THE WTO AND INTERNATIONAL TRADE

The WTO, as a body, is essentially the sum of trade liberalization agreements between member states.<sup>3</sup> Of particular relevance here are two different agreements that fall within this body: the General Agreement on Tariffs and

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<sup>1</sup> As many commentators have noted, after 51 years of accuracy, Moore's "Law" appears to have finally run its course. *For example*, Peter Bright, *Moore's Law Really is Dead this Time*, ARS TECHNICA (Feb 10, 2016, 7:22 PM), <http://arstechnica.com/information-technology/2016/02/moores-law-really-is-dead-this-time/>; Irving Wladawsky-Berger, *If the End of Moore's Law is Near, What's Next?* WALL ST. J. (Aug. 7, 2015, 11:42 AM), <http://blogs.wsj.com/cio/2015/08/07/if-the-end-of-moores-law-is-near-whats-next/>. However, there is no doubt that technology will continue to develop at a rapid pace.

<sup>2</sup> *See, for example*, Peter K. Yu, *Trade Agreement Cats and the Digital Technology Mouse*, in SCIENCE AND TECHNOLOGY IN INTERNATIONAL ECONOMIC LAW: BALANCING COMPETING INTERESTS 185, 185 (Bryan Mercurio & Kuei-Jung Ni eds., 2014) ("[T]he interplay between trade agreements and digital technology [is] one of the least understood areas in international trade law.").

<sup>3</sup> When the GATT was updated in 1994, the Members also created the WTO as an umbrella to include the GATT, GATS, and several other annex agreements. PETROS C. MAVROIDIS, TRADE IN GOODS: THE GATT AND THE OTHER WTO AGREEMENTS REGULATING TRADE IN GOODS 14 (2d ed. 2012).

Trade<sup>4</sup> (GATT) and the General Agreement on Trade in Services<sup>5</sup> (GATS). For the sake of this Comment, there are two relevant differences between the GATT and the GATS. First, the GATT and the GATS govern different types of trade. The GATT applies to international trade in goods<sup>6</sup> while the GATS applies to international trade in services.<sup>7</sup> The second important difference arises out of the different types of trade protected by the two agreements. Although both agreements provide largely similar types of protection,<sup>8</sup> GATT protections apply equally across all international trade of goods, while GATS protections apply only to services for which members states have made a specific commitment to be bound by the agreement.<sup>9</sup> In short, “[u]nlike the GATT, the GATS does not guarantee free market access.”<sup>10</sup>

For businesses engaging in international trade, serious economic concerns hinge on this distinction—any business faced with the opportunity to choose whether its product is classified as a good or a service for the sake of international trade would prefer to be classified as a good and thus fall under the more liberalized regulations of the GATT.<sup>11</sup> For most businesses, however, such a choice would seem farfetched. There is no reasonable debate whether an automobile counts as a good or whether agricultural labor counts as a service. But with digital products, technological advances have made it impossible to classify products based on intuition alone. The next sections analyze how digital products have been treated by the WTO and suggest several potential systems for making consistent classifications in the future.

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<sup>4</sup> Multilateral Agreements on Trade in Goods, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187 [hereinafter GATT].

<sup>5</sup> General Agreement on Trade in Services, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1B, 1869 U.N.T.S. 183 [hereinafter GATS].

<sup>6</sup> GATT, *supra* note 4.

<sup>7</sup> GATS, *supra* note 5.

<sup>8</sup> Technically, the GATT and GATS do not provide the exact same types of protections. For example, both agreements contain “most-favoured-nation” (MFN) provisions but the GATS MFN provision contains a number of exceptions. *See* GATT, *supra* note 4, art. I; *see also* GATS, *supra* note 5, art. II, ¶ 2.

<sup>9</sup> GATS, *supra* note 5, arts. XIX–XX; NELLIE MUNIN, LEGAL GUIDE TO GATS 27 (2010) (“GATS does not impose on the Members a general obligation to allow the access of foreign services or service suppliers into their domestic market.”).

<sup>10</sup> Rolf H. Weber, *Digital Trade in WTO-Law—Taking Stock and Looking Ahead*, 5 ASIAN J. WTO & INT’L HEALTH L. & POL’Y 1, 3 (2010).

<sup>11</sup> Unless, of course, that business was more concerned with protecting its domestic market position, in which case it would prefer more protectionist measures.

### III. THE EVOLUTION OF DIGITAL PRODUCTS

As used in this Comment, a “digital product” refers to any good or service that is in some way made available through the use of digital technology—presumably, the Internet.<sup>12</sup> The WTO was established in 1995, when the world was on the cusp of an Internet revolution.<sup>13</sup> Since then, the WTO has played the role of proverbial cat perpetually chasing the “digital technology mouse.”<sup>14</sup> The WTO has taken action in response to technological change but has failed to resolve the goods-services distinction.<sup>15</sup> During the Singapore Ministerial Conference of December 1996, WTO Members created the Information Technology Agreement.<sup>16</sup> While this Agreement appeared promising, it dealt only with physical products, such as semiconductors, used in the IT industry. The Information Technology Agreement did not specifically cover digital products. Further WTO action has been mostly limited to Appellate Body decisions with limited holdings.<sup>17</sup>

To further analyze the relationship between the WTO and digital products, this Section disaggregates digital products into four different categories: tangible goods ordered through the Internet, electronically delivered services, e-products, and remote additive manufacturing. As the Section shows, international law and the existing literature have gone a long way toward classifying the first three categories of digital products but have left several questions unanswered.

#### A. The Easy Cases—Tangible Goods Ordered Through the Internet and Electronically-Delivered Services

Some digital products are delivered through the Internet or paid for via the Internet but are virtually identical to an existing non-digital good or service. Most modern shoppers are familiar with tangible goods ordered through the Internet.

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<sup>12</sup> See Stewart A. Baker et al., *E-Products and the WTO*, 35 INT'L LAW. 5, 6 (2001) (defining digital products as those “delivered in electronic form via Internet download”).

<sup>13</sup> *Id.* at 5 (“Since the establishment of the [WTO] in 1995, the single most important economic development has been the growth of the Internet and e-commerce.”).

<sup>14</sup> See generally Yu, *supra* note 2.

<sup>15</sup> Tania Voon, *A New Approach to Audiovisual Products in the WTO: Rebalancing GATT and GATS*, 14 UCLA ENT. L. REV. 1, 6–7 (2007).

<sup>16</sup> World Trade Organization, Ministerial Declaration on Trade in Information Technology Products, WT/MIN(96)/16 (1996).

<sup>17</sup> See, for example, Appellate Body Report, *United States—Measures Affecting the Cross-Border Supply of Gambling and Betting Services*, WT/DS285/AB/R (Apr. 7, 2005) [hereinafter Appellate Body Report WT/DS285/AB/R]; Appellate Body Report, *China—Measures Affecting Trading Rights and Distribution Services for Certain Publications and Audiovisual Entertainment Products*, WT/DS363/AB/R (Dec. 21, 2009) [hereinafter *China—Measures Affecting Certain Publications and Audiovisual Entertainment Products*].

When a law student orders a hardback textbook from Amazon, that textbook will be indistinguishable from a book ordered through a paper catalog or purchased directly from the campus bookstore. There is a broad consensus that this textbook, or any other tangible product ordered through the Internet, is a good for the purposes of the WTO.<sup>18</sup> Thus, if the seller of this textbook were located in a different country from the buyer, the importation of the textbook would fall under the purview of the GATT.

Similar reasoning applies to electronically delivered services. Imagine two coworkers that need help filing their respective taxes. One goes to a financial services office down the block while the other uses a tax preparation website, which connects him to advisers from another country, but both receive the same service. The WTO Appellate Body has ruled that “the GATS rules, particularly the existing and revised commitments, fully apply to cross border Internet-based service transactions.”<sup>19</sup> So the GATS applies the same to both coworker’s purchase of tax-preparation services.

Therefore, there is little room for debate on the application of the GATT/GATS framework to these two types of digital products. Accordingly, the rest of the discussion of digital products in this Comment will ignore these types of products.

## B. E-Products

A more challenging case, and the one that has been the focus of scholarly attention, is how to classify “e-products”—“content-based products that formerly were delivered in tangible form but now can be delivered in electronic form via Internet download.”<sup>20</sup> E-products include things like mp3 music files, e-books, or digitally-downloaded movies. E-products play an increasingly large role in the global economy. In 1999, the WTO predicted that e-products would increasingly be a substitute for their physical counterparts,<sup>21</sup> and this prediction has proven true in certain contexts.<sup>22</sup> Existing literature has addressed the role of e-products

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<sup>18</sup> See, for example, Baker, *supra* note 12, at 5–6.

<sup>19</sup> Appellate Body Report WT/DS285/AB/R, *supra* note 17. In this case, the service at issue was online gambling provided to customers in the U.S. by companies in Antigua and Barbuda.

<sup>20</sup> *Id.*

<sup>21</sup> Ludger Schuknecht & Rosa Pérez-Esteve, *A Quantitative Assessment of Electronic Commerce Economic Research and Analysis Division 6*, (World Trade Organization Working Paper, ERAD-99-01) (Sept. 1999).

<sup>22</sup> In 2014, U.S. consumers spent \$7.5 billion on online movie sales and rentals but only \$6.9 billion on DVDs. Claire Atkinson, *Online Video Sales Surpass DVDs as Homes Make Digital a Habit*, N.Y. POST (Jan. 7, 2015, 12:50 AM), <http://nypost.com/2015/01/07/online-video-sales-surpass-dvds-as-homes-make-digital-a-habit/>. Also in 2014, global digital music sales (\$6.85 billion) surpassed CDs sales (\$6.82 billion) for the first time. James Vincent, *Digital Music Revenue Overtakes CD Sales*

under the GATT/GATS framework, but has not determined with any finality which agreement should control.<sup>23</sup>

## C. Remote Additive Manufacturing

### 1. What is additive manufacturing?

The last category of digital products discussed here warrants a broader factual explanation. Additive manufacturing—commonly referred to as “3D printing”—operates by applying consecutive layers of a specific material onto a flat surface until those layers form a three-dimensional object.<sup>24</sup> Because of the way that additive manufacturing makes products appear as if from thin air, commentators have likened it to the “Replicator” device in the popular *Star Trek* television series.<sup>25</sup> Currently, one of the more popularly-discussed uses of additive manufacturing is the construction of toys and trinkets by hobbyists with 3D printers in their homes.<sup>26</sup> But 3D printing also has a large industrial application. Additive manufacturing can be used to create everything “from a lithium-ion microbattery to a human kidney, and can print in materials like plastic, metal, ceramic, cement, wood, food, and human cells.”<sup>27</sup> The industrial uses of additive manufacturing are nearly endless. General Electric uses additive manufacturing for jet engines and medical devices;<sup>28</sup> Lockheed Martin and Boeing 3D print aerospace equipment;<sup>29</sup> a Chinese company developed a system to 3D print entire

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*for the First Time Globally*, THE VERGE (Apr. 15, 2015, 1:56 PM), <http://www.theverge.com/2015/4/15/8419567/digital-physical-music-sales-overtake-globally>. Physical books, however, remain relatively popular as e-books have plateaued at about 20 percent of the market. Alexandra Alter, *The Plot Twist: E-Book Sales Slip, and Print is Far from Dead*, N.Y. TIMES, (Sept. 22, 2015), [http://www.nytimes.com/2015/09/23/business/media/the-plot-twist-e-book-sales-slip-and-print-is-far-from-dead.html?\\_r=0](http://www.nytimes.com/2015/09/23/business/media/the-plot-twist-e-book-sales-slip-and-print-is-far-from-dead.html?_r=0).

<sup>23</sup> Baker, *supra* note 12, at 10 (concluding that WTO members should negotiate new rules for e-products because they cannot be easily classified).

<sup>24</sup> Jasper Tran, *The Law and 3D Printing*, 31 J. MARSHALL J. INFO. TECH. & PRIVACY L. 505, 507–508 (2015).

<sup>25</sup> *Id.*; Vivek Wadhwa, *How Today’s Technology is Rapidly Catching up to Star Trek*, WASHINGTON POST (July 1, 2014), <https://www.washingtonpost.com/news/innovations/wp/2014/07/01/how-todays-technology-is-rapidly-catching-up-to-star-trek/>.

<sup>26</sup> Davis Doherty, Note, *Downloading Infringement: Patent Law as a Roadblock to the 3D Printing Revolution*, 26 HARV. J. L. & TECH. 353, 358 (2012) (noting that 3D printing’s potential to share ideas with consumers around the world “seems undermined by the triviality of reality: a substantial number of publicly available designs are decorations, games, or pop culture references.”).

<sup>27</sup> Tran, *supra* note 24, at 508.

<sup>28</sup> Richard D’Aveni, *The 3D Printing Revolution*, HARV. BUS. REV., May 2015, at 42.

<sup>29</sup> *Id.*

homes;<sup>30</sup> and readers may remember when the Internet was abuzz in 2014 over videos of a dog happily running on 3D-printed legs.<sup>31</sup>

The true value of additive manufacturing is that it can create unique products without changing out equipment—a 3D printer is not a single-purpose device. This is exactly why additive manufacturing is known as “3D printing.” Just as a regular 2D printer can produce any image you desire using a small set of colored inks, a 3D printer can produce any shape you desire using a set supply of printing material. To print a picture of the Mona Lisa, one would not have to tell his 2D printer how to paint stroke-by-stroke, he would simply need to open a digital file containing an image of the Mona Lisa and click “print.” 3D printing works the same way; if one wants to print a Statue of David, all he has to do is open a file containing a rendering of the statute and click “print.” The only difference is that 3D printing uses a special type of file called a Computer-Aided Design (“CAD”) file.<sup>32</sup> Like any other digital file, this CAD file can be transmitted across borders via the Internet.<sup>33</sup>

## 2. Legal treatment of additive manufacturing.

As a new technology, additive manufacturing raises several novel legal issues.<sup>34</sup> The relevant concern here is whether additive manufacturing should be treated as a good or service under the WTO agreements. It seems clear that a 3D printer itself would be treated as a good under the GATT. Similarly, the products created in additive manufacturing should be treated as goods if they are sold through international commerce. The real problem here is whether a CAD file sent over the Internet in international commerce should be treated as a good or service.

To illustrate this issue, I turn to a recent U.S. case dealing with a substantially similar matter. At issue in *ClearCorrect Operating v. International Trade Commission*,<sup>35</sup> was whether a CAD file counts as an “article” that can be regulated by U.S. Customs and Border Protection when it enters the country. Although the legal

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<sup>30</sup> Tuan C. Nguyen, *Yes, That 3D-printed Mansion is Safe to Live In*, WASHINGTON POST (Feb. 5, 2015), <https://www.washingtonpost.com/news/innovations/wp/2015/02/05/yes-that-3d-printed-mansion-is-safe-to-live-in>.

<sup>31</sup> James Vincent, *Disabled Dog Runs for the First Time Thanks to 3D-Printed Leg*, THE VERGE (Dec. 18, 2014, 7:52 AM), <http://www.theverge.com/2014/12/18/7414591/disabled-dog-runs-for-the-first-time-thanks-to-3d-printed-legs>.

<sup>32</sup> Tran, *supra* note 24, at 508. Another helpful analogy is to think of the CAD file like a blueprint and the 3D printer like the construction crew.

<sup>33</sup> *Id.*

<sup>34</sup> *See id.* at 510.

<sup>35</sup> 810 F.3d 1283 (Fed. Cir. 2015). ClearCorrect is a U.S. company that sells clear plastic dental aligners. Readers may be more familiar with its competitor Invisalign.

reasoning applied by the U.S. courts does not provide much of a guide for interpreting WTO law, the facts of *ClearCorrect* provide a useful framework. ClearCorrect measures customer's teeth in the U.S. and sends the measurements to Pakistan where engineers create a 3D rendering of a dental aligner.<sup>36</sup> The Pakistani engineers then send a CAD file back to the U.S. where ClearCorrect uses a special 3D printing machine to manufacture custom dental aligners.<sup>37</sup> If ClearCorrect were using a traditional form of outsourcing to manufacture goods, they would probably have U.S. engineers create a 3D model and send that model to another country where it would be manufactured by a domestic company that would ship the finished product back to the U.S. If that were the case, there would be no debate that the finished dental aligners imported into the U.S. are governed by GATT law because they clearly would be considered goods.

### 3. Why focus on additive manufacturing?

The above description illustrates the potential impact that additive manufacturing may have on future supply chains, but 3D printing may still seem like a particularly niche issue in the world of international trade. While this may be true, additive manufacturing is legally important because of the larger technological trend that it represents. It is but a timely example of a new technology that resists categorization in the current goods-services dichotomy. The goal of this Comment is not, therefore, to decide whether CAD files should be treated as goods or services merely so WTO members will know how to treat them as imports. Its goal is to use WTO treatment of additive manufacturing as a bellwether for the legal treatment of other new technologies as they arise. It is particularly important that that the literature in this area remain forward-looking because solutions to current technology-related problems can quickly become obsolete.<sup>38</sup>

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<sup>36</sup> *Id.* at \*1287.

<sup>37</sup> *Id.*

<sup>38</sup> When read years after its publication, even research with excellent legal analysis appears quaint in its treatment of technology. In a very well-reasoned 2001 article, Andrew Mitchell differentiated Amazon from brick-and-mortar bookstores because Amazon had the ability to "provide a consumer with an instant selection of books based on that consumer's past purchases." Andrew Mitchell, *Towards Compatibility: The Future of Electronic Commerce Within the Global Trading System*, 4 J. INT'L ECON. L. 683 (2001). Modern readers would not rank Amazon's book suggestions among its top differences from brick-and-mortar bookstores, but Mitchell's research is still relevant because the underlying legal issues are largely the same.

#### IV. A GOODS-SERVICES FRAMEWORK FOR DIGITAL PRODUCTS

Even if a unified rule-making body were able to keep pace with technological change, the WTO would still struggle to reach a resolution on the legal treatment of digital products because its members have their own political and economic interests. The European Commission has interpreted WTO law to plainly mean that “[e]lectronic deliveries consist of supplies of services which fall within the scope of the GATS.”<sup>39</sup> However, the U.S. disagrees: “there may be an advantage to a GATT versus GATS approach to [digital] products which could provide for a more trade-liberalizing outcome for electronic commerce.”<sup>40</sup> This conflict highlights the need for a neutral system to classify digital products. While existing literature has not ignored the problem of digital products in international trade, it has thus far failed to provide a positive framework for their classification. This Section lays out three different methods of differentiating goods from services, each one representing a different level of abstraction. First, this Section discusses a formalistic approach based on the definitions of goods and services. Second, it reviews a functional approach emphasizing consistency across different provisions of the GATT and GATS. Finally, it proposes a new theoretical approach based on the WTO’s underlying goals in international trade.

##### A. Definitions—A Formalistic Approach

The easiest way to determine whether a digital product is a good or service would be to follow the definitions of those terms in the GATT and GATS. Unfortunately, the text of these WTO agreements does not provide any meaningful definitions. The GATT provides no specific definition of “goods” and the GATS circularly defines services as “any service in any sector except services supplied in the exercise of governmental authority.”<sup>41</sup> For digital products in particular, neither the agreements themselves nor other WTO initiatives<sup>42</sup> provide

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<sup>39</sup> Council for Trade in Services, *Communication from the European Communities and their Member States: Electronic Commerce Work Programme*, ¶ 6(a), S/C/W/183 (Nov. 30, 2000).

<sup>40</sup> *Work Programme on Electronic Commerce: Submission by the United States*, ¶ 7, WT/COMTD/17, WT/GC/16, G/C/2, S/C/7, IP/C/16 (Feb. 12, 1999) [hereinafter *Work Programme on Electronic Commerce: Submission by the United States*].

<sup>41</sup> GATS, *supra* note 5, art. I ¶ 3(b).

<sup>42</sup> In 1998, the WTO General Council created the Work Programme on Electronic Commerce to “examine all trade-related issues relating to global e-commerce, taking into account the economic, financial and development needs of developing countries.” C. Satapathy, *WTO Work Programme on Electronic Commerce: A Developing Country Perspective*, 34 *ECON. & POL. WKLY.* 2771, 2771 (1999). Unfortunately, the Work Programme has thus far been unable to classify digital products.

a robust definition of “digital trade,” “digital goods,” or “digital services.”<sup>43</sup> Both the dictionary and common usage provide more useful definitions.

### 1. Dictionary definitions.

The Merriam-Webster Dictionary defines a “good” as “personal property having intrinsic value . . .” or “something manufactured or produced for sale,”<sup>44</sup> and defines “service” as “the work performed by one that serves.”<sup>45</sup> While the dictionary definition of service is just as circular as the one provided in GATS, the dictionary definition of “good” implies a principled distinction. The requirement that a good is “manufactured or produced for sale” implies a temporal element to a good that differentiates it from a service. A good is manufactured *then* sold whereas a service only exists during the time period that it is being “performed by one that serves.”<sup>46</sup> Once the good is sold, it is out of the manufacturer’s hands—it is complete. Following this distinction, e-books and CAD files are no different from toy soldiers or ballpoint pens. Each follows the two-stage process of being first produced and then sold, thus both would be classified as goods.

Of course, some elements of digital products make the dictionary definitions of “goods” and “services” less than perfect. There are many types of goods that, once purchased, can be brought back to the manufacturer for further refinement or customization but none that have the same iterative capacity as digital products. If a consumer buys a suit at Macy’s, that consumer has purchased a good. If the next week, the same consumer takes the pants back to be hemmed, we would not say that the consumer is buying *another* good. Under the dictionary definition, the pants are not being “manufactured or produced” another time—they are simply altered. Turning back to the ClearCorrect example, we see that the same reasoning may not apply to digital products. Once ClearCorrect receives the 3D CAD file in the U.S., it may wish to tweak the design (maybe the front left incisor needs to be rotated another degree to the left). If the CAD file is treated as a good under the dictionary definition of the term, then how do we treat the second iteration of the file? Unlike the ill-fitting pants, the CAD file does not need to be sent back to the Pakistani engineers for readjustment. The engineers presumably still have the original file so they can make the necessary adjustments then send a second version of the CAD file back into the U.S. Should the two files be treated the same for consistency’s sake or is the second file more akin to hemming the ill-fitting

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<sup>43</sup> Weber, *supra* note 10, at 2.

<sup>44</sup> *Good*, MERRIAM-WEBSTER DICTIONARY, <http://beta.merriam-webster.com/dictionary/goods> (last visited April 23, 2016).

<sup>45</sup> *Service*, MERRIAM-WEBSTER DICTIONARY, <http://beta.merriam-webster.com/dictionary/service> (last visited April 23, 2016).

<sup>46</sup> *Id.*

pants, making the first iteration a good and treating the adjustment as a service? Dictionary definitions are ultimately incapable of answering this question, but common-usage definitions provide a more principled distinction.

## 2. Common-usage definitions—tangibility and essential characteristics.

One common usage distinction often applied to goods and services is that goods are tangible while services are intangible.<sup>47</sup> In *Canada-Certain Measures Concerning Periodicals*, the WTO Appellate Body decided that periodicals were a tangible product of ink and paper so they could not be classified as services.<sup>48</sup> Again, this distinction initially appears to provide a simple solution for digital products. A digital product is not tangible. Therefore it is a service. With e-products, however, this produces the perplexing result that a CD would be treated as a good while the digital version of the same album would be treated as a service.<sup>49</sup> With 3D printing, this distinction also produces less than satisfactory results.

In *ClearCorrect*, the Federal Circuit used different language but effectively applied the tangibility test. The court held that an “article” must be a “material thing” and that “common sense dictates that there is a fundamental difference between electronic transmissions and ‘material things.’”<sup>50</sup> The 3D renderings sent from ClearCorrect’s engineers in Pakistan to its manufacturers in the U.S. were held to be immaterial.<sup>51</sup> This simple rule creates a straightforward conclusion, but the long-term consequences of the tangibility test lead to unsatisfactory results. With the press of a button, ClearCorrect can transform a CAD file (an intangible service) into a physical object (a tangible good).<sup>52</sup> This confusion has led some to abandon the traditional tangibility distinction between goods and services.<sup>53</sup>

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<sup>47</sup> Baker, *supra* note 12, at 9.

<sup>48</sup> Appellate Body Report, *Canada-Certain Measures Concerning Periodicals*, WT/DS31/AB/R (June 30, 1997).

<sup>49</sup> As discussed below in Section 2.B *infra*, this creates a problem of technological neutrality.

<sup>50</sup> *ClearCorrect*, *supra* note 35, at \*1286.

<sup>51</sup> *Id.* at \*1299. The *ClearCorrect* court explicitly eschewed a more technical test in favor of a common sense tangibility distinction: “We recognize, of course that electronic transmissions have some physical properties—for example an electron’s invariant mass is a known quantity—but common sense dictates that there is a fundamental difference between electronic transmissions and ‘material things.’” *Id.* at \*1286.

<sup>52</sup> *Id.* at \*1287.

<sup>53</sup> For example, Peter Hill, *Tangibles, Intangibles and Services: A new Taxonomy for the Classification of Output*, 32 CAN. J. ECON 426 (1999).

Peter Hill provides a “new taxonomy” whereby he starts by breaking goods down into two different categories: tangible goods and intangible goods.<sup>54</sup> Because he concludes that tangibility alone does not define a good, Hill instead turns to the essential characteristics of all goods.<sup>55</sup> Hill explains that the essential characteristic of a good is that it is “an entity over which ownership rights may be established and from which its owner(s) derives some economic benefit,”<sup>56</sup> while services are necessarily “used-up” by their single occurrence.<sup>57</sup> At first blush, this distinction provides an easy way to deal with digital products. A digital file (including a CAD file), once downloaded, is possessed by the downloader. She can use the file for any purpose or move the file from one device to another without the file being “used up.” The U.S. has supported this line of reasoning in reference to the WTO Work Programme on Electronic Commerce, arguing that “[w]hile the *transmission* of these products can certainly be characterized as a service, the products themselves are not consumed in their transmission, but rather retain a permanence analogous to the goods world.”<sup>58</sup> Under the “used up” definition of a service, most digital products would therefore better fit under GATT protection as goods.

There is, however, another sense in which digital products do not have the essential characteristic of “ownership.” Unlike traditional products, digital files are non-exclusive: one person’s possession of a digital product does not restrict another person’s possession of that very same product. If someone trades a paper book, she will no longer be able to read and enjoy that book;<sup>59</sup> if someone trades a file containing an e-book, she can retain a copy of the file for herself. Yet digital products are not exactly non-rivalrous goods because they are not freely available to all comers. Fortunately, this distinction does not pose as big of a hurdle for the classification of digital products as it may seem. Because the non-exclusive nature of their products makes them ripe targets for piracy, producers of digital products often employ “digital rights management”<sup>60</sup> technology.<sup>61</sup> With this technology,

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<sup>54</sup> *Id.* at 437.

<sup>55</sup> *Id.*

<sup>56</sup> *Id.* at 437-38.

<sup>57</sup> Baker, *supra* note 12, at 9 (Services “involve some desired change cause by the service provider to something owned by the consumer or to the physical or mental state of the consumer himself.”).

<sup>58</sup> *Work Programme on Electronic Commerce: Submission by the United States*, *supra* note 40, at 5. Of course, the U.S. is the world’s largest exporter of digital media so it has a vested interest in having the GATT apply to digital products like music and movies. Baker, *supra* note 12, at 7.

<sup>59</sup> Admittedly, paper books are not the best example of exclusive goods because the true value of a book is not in the paper and in but in the meaning of the words. This means that the marginal cost of producing another copy of a book is low compared the cost of originally writing the book.

<sup>60</sup> Commonly known as “DRM.”

<sup>61</sup> S.R. Subramanya & Byung K. Yi, *Digital Rights Management*, 25 IEEE POTENTIALS 31, 31 (2006).

producers can eliminate a file's capacity to be traded from one owner to another.<sup>62</sup> While one could argue that tradability is an essential component of ownership, digital right management solves the non-exclusive element of digital products, which makes them much more akin to their non-digital counterparts. Again, this reinforces the notion that digital products possess the essential characteristics of goods, bringing them under the purview of the GATT.

Ultimately, the problem with using formalistic definitions of goods and services is that it necessarily relies on inductive reasoning—making decisions for the future based on what was done in the past. This means that definitions are useful for setting boundaries on what it means to be a good or service but not as helpful for the classification of any given product.

## B. Likeness—A Functional Approach

A more practical way of classifying digital products under international law is to apply basic WTO principles to determine whether a given product should be treated as a good or service. One of the fundamental principles of international trade law in the WTO is the “likeness principle.”<sup>63</sup> Under this principle, countries should give like treatment to like goods and services.<sup>64</sup> Although the likeness principle is well established in international law, the literature does not fully explain how it could be used to classify digital products.<sup>65</sup>

The first formulation of the likeness principle focuses on trade neutrality.<sup>66</sup> Under this formulation, two products are “alike” when they “stand in a competitive relation to each other.”<sup>67</sup> The WTO Appellate Body has put forth a four-part test for likeness:

- (i) physical properties of the products;
- (ii) the extent to which the products are capable of serving the same or similar end-uses;
- (iii) the extent to which consumers perceive and treat the products as alternative means of performing particular functions in order to satisfy a particular want or demand;

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<sup>62</sup> *Id.*

<sup>63</sup> Baker, *supra* note 12, at 9.

<sup>64</sup> *Id.*

<sup>65</sup> Weber, *supra* note 10, at 12 (observing that the likeness approach “merits to be looked at in further detail” for this application.).

<sup>66</sup> Baker, *supra* note 12, at 9; Appellate Body Report, *Japan—Taxes on Alcoholic Beverages*, WT/DS8/AB/R, at 23-24 (Oct. 3, 1996).

<sup>67</sup> Weber, *supra* note 10, at 12.

(iv) the international classification of the products for tariff purposes.<sup>68</sup> Under this test, no single factor is controlling.<sup>69</sup> The second formulation of the likeness principle looks at technological neutrality. Technological neutrality means that products should be treated the same no matter which technology is used to deliver them.<sup>70</sup> Thus, a digital file cannot be treated differently based on whether it is transported through the Internet or on a CD (whether the CD was purchased directly from a store or ordered online).<sup>71</sup> The Appellate Body has acknowledged the principle of technological neutrality but failed to enunciate a clear rule for how to put it into practice.<sup>72</sup>

Overall, the likeness principle proposes a simple rule: under international trade law, digital products should be treated the same as their physical analogs.<sup>73</sup> Stewart Baker reached a compelling result applying this principle to e-products.<sup>74</sup> Because e-products like e-books or digital music files have clear physical analogs—paper books and CDs—they should be treated as goods under international trade law.<sup>75</sup> Although there is still not a clear consensus on how to classify e-products with obvious physical analogs,<sup>76</sup> they do highlight the appeal of the likeness principle in practice. It is less obvious how the likeness principle should apply to more unique digital products like CAD files.

One application of the likeness principle could be that the 3D rendering should be treated the same as the finished product that it is used to produce. In the ClearCorrect case, for example, an easy solution would be to treat the CAD files holding the design for the clear dental aligners the same as the clear dental aligners themselves. Both would be treated as goods under the GATT. The appeal

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<sup>68</sup> Appellate Body Report, *European Communities—Measures Affecting asbestos and Asbestos-Containing Products*, ¶¶ 133-48, WT/DS135/AB/R (Mar. 12, 2001).

<sup>69</sup> Donald H. Regan, *Regulatory Purpose and ‘Like Products’ in Article III:4 of the GATT (With Additional Remarks on Article III:2)*, 36 J. WORLD TRADE 443, 446 (2002) (cautioning that “the appeal to physical likeness is seductive . . . [but] cannot provide the ultimate criterion.”).

<sup>70</sup> Baker, *supra* note 12, at 10 (citing Group on Basic Telecommunications, *Notes for Scheduling Basic Telecom Services Commitment*, 5/GBT/W/2/Rev.1, ¶ 1(c) (Jan. 16, 1997)).

<sup>71</sup> Althaf Marsoof, *A Case for Sui Generis Treatment of Software under the WTO Regime*, 29 INT’L J. OF L. & INFO. TECH. 291, 304–305 (2012).

<sup>72</sup> *China—Measures Affecting Certain Publications and Audiovisual Entertainment Products*, *supra* note 17, WT/DS363/AB/R (Dec. 21, 2009) (finding that the principle of technological neutrality, “was irrelevant [to the facts of the dispute] because network music services is a new and distinct service”).

<sup>73</sup> Baker, *supra* note 12, at 9.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> See, for example, Voon, *supra* note 15, at 8–9 (“The classification as goods or services of products that are, or could take, a digital rather than physical form has long been disputed in the GATT and WTO.”).

of this interpretation is that it would create some horizontal consistency. A company importing a CAD file then 3D printing its dental aligners would face the same international trade restrictions as a company importing the dental aligners themselves.<sup>77</sup> This interpretation is appealing because it would require the WTO to treat ClearCorrect the same regardless whether it leveraged cheaper labor costs in another country to manufacture its dental aligners or leveraged cheaper CAD design costs in another country to design its dental aligners then manufactured them domestically. Either way, using the international market to produce a good means that the good will be subject to GATT treatment.

Systemically, treating ClearCorrect's CAD files as goods would not create a problem of inconsistency because ClearCorrect imports one CAD file for every one dental aligner that it prints—no two sets of teeth are the same. But ClearCorrect's supply chain model is not generalizable across all uses of additive manufacturing. There are also 3D-printed products with production runs greater than one. If a Chinese company designs a CAD file to print an entire house and a U.S. developer imports that file, then the developer could fill a whole neighborhood with copies of the same house. This creates the same non-exclusivity problem discussed above when considering whether a digital product could be "owned." Applying true technological consistency, a house should be treated the same no matter whether it is delivered through a digital file or through boxes of prefabricated components. But this sort of consistency is not achieved if the 3D printed house is only subject to trade restrictions once whereas the physical analog would be subject to the same restriction for each copy of the house that is imported.

Perhaps a better analogy for a CAD file is a blueprint or set of instructions, both of which are goods. Again, at first glance, this appears to be a good fit. A 3D rendering and a set of blueprints appear similar and serve similar functions. A blueprint is a cheap good (paper and ink) that is the result of a more valuable service. However, a country that wants to protect against the importation of services under GATS but is open to freer trade under GATT would not have to worry about the importation of a blueprint because another service (construction) must be purchased before the blueprint turns into a good. A CAD file, on the other hand, only needs a 3D printer to turn it into a good, and operating a 3D printer does not create domestic jobs like constructing a building would.

While the likeness principle is at first an appealing decision-making process, it falls into the same inductive reasoning trap as formalistic definitions. A system that relies on comparisons to the past is ill-suited to make decisions based on novel factual patterns. The likeness principle ignores the possibility (or perhaps more accurately, the inevitability) that technological innovation will create digital products that simply do not have physical analogs. In an attempt to solve this

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<sup>77</sup> As I note in Section III, *infra*, this sort of equal treatment might not be desirable on a systemic level.

problem, this Comment will next turn to a more deductive method of differentiating between goods and services based on the theories underlying the WTO agreements.

### C. Goals of the WTO—A Theoretical Approach

The most principled way to distinguish whether trade in a digital product should be regulated under the GATT or the GATS is to identify the goals of these agreements and interpret them in the way that best promotes those goals. This Section highlights two goals of the GATT and GATS: liberalizing trade and protecting the service sectors in developing economies.<sup>78</sup> While the primary goal of the WTO is to promote free trade,<sup>79</sup> the GATS was created with a second goal of allowing developing economies to compensate for existing “asymmetries.”<sup>80</sup> In this Section, I argue that that the second goal, allowing a degree of protection for developing economies, is particularly relevant to the international market for digital products.

#### 1. Goals enunciated in GATT and GATS preambles.

To identify the goals of WTO agreements, we must first turn to the text.<sup>81</sup> Both the GATT and GATS contain preambles that in some way express the purpose of the agreements. The preamble to the GATT recognizes that international trade should be “conducted with a view to raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, developing the full use of the resources of the world and expanding the production and exchange of goods.”<sup>82</sup> The GATT’s preamble goes on to explicitly state that these goals are to be accomplished through “reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminatory treatment in international commerce.”<sup>83</sup> In this way, the text of the GATT contains not only a desired outcome but also the proper means to achieve that outcome: trade liberalization.

The GATS does not contain such a concise statement of its purpose, but its preamble does highlight the agreement’s dual goals of expanding trade

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<sup>78</sup> GATT, *supra* note 4, pmble; GATS, *supra* note 5, pmble.

<sup>79</sup> Chios Carmody, *A Theory of WTO Law*, 11 J. INT’L ECON. L. 527, 541 (2008).

<sup>80</sup> GATS, *supra* note 5, pmble.

<sup>81</sup> David Palmeter & Petros C. Mavroidis, *The WTO Legal System: Sources of Law*, 92 AM. J. INT’L L. 398, 398 (“The fundamental source of law in the WTO is therefore the texts of the relevant covered agreements themselves. All legal analysis begins there.”).

<sup>82</sup> GATT, *supra* note 4, pmble.

<sup>83</sup> *Id.*

liberalization to services while also protecting the national interests of developing countries.<sup>84</sup> The GATS preamble makes particular note of “the right of Members to regulate . . . the supply of services within their territories in order to meet national policy objectives” and recognizes “asymmetries existing with respect to the degree of development of services regulations in different countries.”<sup>85</sup>

Comparing these two statements of purpose shows that both agreements have a shared goal of liberalizing international trade but that the WTO recognizes the lower capacity of developing countries to cultivate domestic service markets without higher protection than that accorded to their domestic goods markets. This means that international trade in digital products should be analyzed under the dual framework of promoting liberalized trade and protecting service-providers in developing countries.

## 2. Economic goals of trade liberalization.

Economists generally agree that the purpose of trade liberalization is to create gains by exploiting each country’s comparative advantage.<sup>86</sup> Under this line of thinking, the world would be better off with free international trade. However, under the terms-of-trade theory, international trade is conceptualized as a Prisoner’s Dilemma.<sup>87</sup> The best result for the whole system is liberalized trade, but the best result for any individual nation is to be the one country that can benefit from protectionist restrictions while the rest of the world eliminates barriers to trade. International trade agreements solve the Prisoner’s Dilemma, at least to an extent, by creating standard rules that every Member must follow.<sup>88</sup> The Prisoner’s Dilemma is but one characterization of the need for free trade agreements.

The commitment theory postulates that special interest groups have influence over domestic trade policy such that lawmakers must bind themselves to an international agreement to avoid bending to special interest.<sup>89</sup> This way, when domestic lobbies ask for protectionist measures, government officials can claim that their hands are tied by international law.<sup>90</sup> Yet another explanation for

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<sup>84</sup> GATS, *supra* note 5, pmble.

<sup>85</sup> *Id.*

<sup>86</sup> MAVROIDIS, *supra* note 3, at 14.

<sup>87</sup> Paul Krugman, *The Move Toward Free Trade Zones*, 35 *ECON. REV.* 1, 25 (1991); MAVROIDIS, *supra* note 3, at 19; Ralph Ossa, *A “New Trade” Theory of GATT/WTO Negotiations*, 119 *J. POL. ECON.* 122, 123 (2011).

<sup>88</sup> In their reading of the GATT’s preamble, Kyle Bagwell and Robert Staiger argue that “free trade is not the stated objective of the GATT” and that its real purpose is to “escape from a terms-of-trade-driven Prisoner’s Dilemma.” Kyle Bagwell & Robert W. Staiger, *Economic Theory and the Interpretation of the GATT/WTO*, 46 *AM. ECON.* 3, 11, 16 (2003).

<sup>89</sup> MAVROIDIS, *supra* note 386, at 16.

<sup>90</sup> *Id.*

international trade agreements is that they create a uniform set of rules which allows business to safely “make informed decisions about future actions.”<sup>91</sup> Under any of these explanations, the underlying goal of international trade agreements remains the same: increased gains through free trade.

There is a compelling argument that the sole purpose of both the GATT and the GATS is to liberalize trade.<sup>92</sup> Article XIX of the GATS implies some parity of purpose between the GATT and the GATS over time, stating, “Members shall enter into successive rounds of negotiations . . . with a view to achieving a progressively higher level of liberalization.”<sup>93</sup> However, this explanation of trade agreements fails to account for the differences between the GATT and the GATS. Why would the GATS allow for more protectionist measures if there were no principled difference between the WTO’s goals regarding trade in goods and trade in services?

### 3. Protectionist goal of the GATS.

If we take the GATS preamble seriously, then the agreement has a competing goal of allowing developing economies to impose regulations to protect their domestic service industries.<sup>94</sup> Even if the overarching purpose of the GATT and the GATS is to liberalize trade, the agreements contain several specific provisions that run contrary to this purpose, meaning that it is not farfetched to suggest that they serve multiple purposes.<sup>95</sup> As the GATS preamble suggests, the relatively weak position of domestic service-providers in developing economies means they may need more protection than manufacturers of goods in those same economies. The concern under a completely liberalized system of trade in services is that consumers in developing countries would almost always be able to get a better product by purchasing services from foreign companies, meaning that domestic services would never have the chance to develop. Ha-Joon Chang describes this problem by reviving Friedrich List’s concept of “kicking away the

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<sup>91</sup> Carmody, *supra* note 78, at 542.

<sup>92</sup> See, for example, Sandrine Cahn & Daniel Schimmel, *The Cultural Exception: Does it Exist in GATT and GATS Frameworks? How Does it Affect or is it Affected by the Agreement on TRIPS?*, 15 CARDOZO ARTS & ENT. L. J. 282, 291 (1997) (“The purpose of GATS . . . is to extend the general principles of GATT to international trade in services.”).

<sup>93</sup> GATS, *supra* note 5, art. XIX ¶ 1.

<sup>94</sup> See *id.* pmble.

<sup>95</sup> Article XX provides many general exceptions to the GATT’s equal treatment principles. These include measures “necessary to protect public morals” and measures “imposed for the protection of national treasures of artistic, historic or archaeological value.” GATT, *supra* note 4, art. XX(a), (f).

ladder.”<sup>96</sup> Recognizing the same asymmetries as the GATS preamble, Chang argues for allowing “developing countries to adopt the policies (and institutions) that are more suitable to their stages of development and to the conditions they face.”<sup>97</sup> To do otherwise, Chang argues, would be to allow developed countries to benefit from such policies and then “kick away the ladder” so no other countries could follow their progress.<sup>98</sup>

#### 4. WTO goals and digital products.

If the primary goal of the WTO is to liberalize trade, then digital products that have some characteristics of goods and some characteristics of services should be treated as goods so that they are subject to the more liberal rules of the GATT. This conclusion, however, lacks certain appeal because it would be equally true for *any* product. That is, if full liberalization is the goal, then all goods-services disputes should be resolved by applying the GATT. Full stop. To look for a more principled solution, I focus specifically on the salient features of the digital economy. Because developing economies have a systemic disadvantage in the digital products market due to factors such as underdeveloped infrastructure, and because the GATS purports to recognize such “asymmetries,”<sup>99</sup> I argue that the underlying WTO goals suggest that digital products in the gray area between goods and services should be governed by the GATS.

Although it is difficult to precisely measure international trade in digital products,<sup>100</sup> it is clearly a growing market<sup>101</sup> dominated by developed economies.<sup>102</sup> Even though Internet communications technology currently contributes

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<sup>96</sup> Ha-Joon Chang, *Kicking Away the Ladder: Infant Industry Promotion in Historical Perspective*, 31 OXFORD DEV. STUD. 21, 29 (2003).

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

<sup>99</sup> GATS, *supra* note 5, pmble.

<sup>100</sup> U.S. INTERNATIONAL TRADE COMMISSION, DIGITAL TRADE IN THE U.S. AND GLOBAL ECONOMIES, PART 1, 4-1 (2013) (“Comprehensive statistics for international digital trade are unavailable.”); John Haltiwanger & Ron S. Jarmin, *Measuring the Digital Economy*, in UNDERSTANDING THE DIGITAL ECONOMY 13, 15 (Erik Brynjolfsson & Brian Kahin eds. 2001) (“Given the pace of technological change . . . institutions which collect economic and demographic data are behind in measuring the magnitude and scope of IT’s impact on the economy.”).

<sup>101</sup> It is estimated that the U.S. alone exported almost \$400 billion in digital products in 2012. U.S. INTERNATIONAL TRADE COMMISSION, *supra* note 100, at 4-3.

<sup>102</sup> Ifiedo and Davidrajuh note that “developed countries tend to be more in the pathway of this tsunami of change,” commonly referred to as the “digital divide.” Princely Ifiedo & Reggie Davidrajuh, *Digital Divide in Europe: Assessing and Comparing the E-Readiness of a Developed and an Emerging Economy in the Nordic Region*, 2 ELECTRONIC GOVERN 111, 112 (2005); see also *World Development Report 2016: Digital Dividends*, WORLD BANK, 12-13 (2016), [http://www.wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2016/01/13/090224b08405ea05/2\\_0/Rendere d/PDF/World0developm0000digital0dividends.pdf](http://www.wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2016/01/13/090224b08405ea05/2_0/Rendere d/PDF/World0developm0000digital0dividends.pdf).

significantly more to developed countries' GDPs than to developing countries' GDPs,<sup>103</sup> the Internet has expanded into developing countries at an astounding rate.<sup>104</sup> Many observers have identified the digital economy as an opportunity to create jobs in developing countries.<sup>105</sup> However, developing economies typically lack the infrastructure and access to technology found in developed countries, which puts them at a unique disadvantage to compete in the market for digital products.<sup>106</sup> As Ben Ramalingam notes,

[t]his is problematic because those are precisely the jobs that are being replaced by digital automation in developed economies. The real long-term benefits of digital jobs are not in delivery of digital products or services but in digital design, creation and engineering. As such, positioning digital technologies as the answer for disadvantaged African young people risks lining them up in a race where the odds are stacked against them, by positioning them in the lower end of winner-take-most markets.<sup>107</sup>

So if we believe that the real distinction between the GATT and the GATS is that the GATS is meant to protect developing economies in the markets where they are unable to compete with developed economies, digital products seem to be a perfect fit for the GATS's added level of protection.

Although there is currently no robust data on the additive manufacturing flows between developed and developing economies, we can imagine trade occurring in both directions. On one hand, in supply chains like ClearCorrect's, digital products flow from developing economies into developed economies. Because Pakistan has a large domestic supply of engineers, ClearCorrect is able to leverage Pakistan's comparative advantage in low-cost CAD design. However, the limited data available suggests that trade in digital goods is more likely to flow from developed economies into developing economies. First, advanced digital economies like the U.S. consistently have digital exports that outstrip their digital

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<sup>103</sup> WORLD BANK, *supra* note 102, at 12–13.

<sup>104</sup> *Id.* at 5 (“The internet and related technologies have reached developing countries much faster than previous technological innovations.”).

<sup>105</sup> See, for example, Dalberg, *Digital Jobs in Africa: Catalyzing Inclusive Opportunities for Youth*, ROCKEFELLER FOUNDATION 5 (2013), [http://www.dalberg.com/documents/Digital\\_Jobs\\_in\\_Africa.pdf](http://www.dalberg.com/documents/Digital_Jobs_in_Africa.pdf) (acknowledging a “shared recognition that, as Africa’s economic growth continues, the digital economy will have a net positive impact on jobs and income generation”); Ben Ramalingam, *Can Digital Jobs Solve Africa’s Unemployment Crisis*, INST. FOR DEV. STUD., 1 (2016), <http://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/8835/RRB13.pdf?sequence=1> (recommending digital jobs as a solution to Africa’s youth unemployment problem).

<sup>106</sup> Dalberg, *supra* note 105, at 8.

<sup>107</sup> Ramalingam, *supra* note 105, at 3.

imports.<sup>108</sup> Second, an in-depth study of the e-readiness of Sweden and the less developed digital economy of Estonia found that both countries had similar demand for digital products but that Sweden had a greater supply.<sup>109</sup> A more intuitive approach supports this limited data. In the case of additive manufacturing, ClearCorrect's use-case seems anomalous compared to the more likely scenario of engineers in developing economies creating CAD files and sending them into developed economies where the products are 3D-printed and sold locally.

## V. SYNTHESIS AND PROPOSED SOLUTION

This Comment has described three different methods of classifying digital products under the goods-services dichotomy. The dictionary definitions and essential characteristics of goods and services suggest that digital products, including files for additive manufacturing, should be treated as goods. Using these guides to taxonomy, the GATT should apply to digital products, meaning that they would be subject to the fewest protectionist restrictions possible. However, both tangibility and the underlying goals of the WTO support classifying digital products as services under the GATS. Finally, the likeness principle highlights the practical concerns of classification but ultimately does not provide a strong answer as to whether digital products are better treated as goods or services. In this Section, I discuss possible routes out of this taxonomical morass. One body of literature argues in favor of a *sui generis* approach to classification, but I conclude that a *sui generis* approach is impracticable and instead propose a cost-minimizing analysis using this Comment's three-part classification taxonomy.

### A. *Sui Generis* Solutions

Many commentators have at least partially abandoned the GATT-GATS distinction for digital products and instead argued for a *sui generis* approach.<sup>110</sup> Althaf Marsoof argues for a novel taxonomy that addresses many of the unique problems posed by classifying digital products. According to Marsoof, the ideal system would incorporate intellectual property rights and consider whether software is tailor-made or sold "off the shelf."<sup>111</sup> Hosuk Lee-Makiyama takes a similarly novel approach by suggesting that the ideal way to "future-proof"

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<sup>108</sup> One study showed that U.S. had higher digital exports between 2007 and 2011, reaching digital imports of \$221.3 billion and exports of \$356.1 billion in 2011. U.S. INTERNATIONAL TRADE COMMISSION, *supra* note 100, at 4-3.

<sup>109</sup> Ifinedo & Davidrajuh, *supra* note 102, at 127.

<sup>110</sup> See, for example, Marsoof, *supra* note 71.

<sup>111</sup> *Id.* at 306-10.

international trade law to properly govern digital products is an overhaul of the WTO's Information Technology Agreement.<sup>112</sup> Other commentators have not gone so far as to suggest an entirely new system but have proposed serious amendments to current trade agreements.<sup>113</sup>

While *sui generis* arguments have a certain intellectual appeal, they fail to recognize the political realities of international trade law. *Sui generis* proposals attack the current WTO regime for being outdated. It is true that WTO law has been unable to match pace with technology. But considering the glacial pace of international negotiation and the amount of time spent developing the current regime of international trade law, it seems paradoxical to conclude that the best solution is for the WTO to write a whole new body of law. By the time the new regime went into effect, it would be made obsolete by yet newer technologies.<sup>114</sup> My proposal is, therefore, to reach a solution within the current goods-services dichotomy.<sup>115</sup>

## B. A New Approach: Cost-Minimizing Interpretation

Given the fact that different classification methods lead to different results, classifying digital products as either goods or services necessarily will have downsides. The goal should be to minimize the downsides while still making a classification.<sup>116</sup> I propose a two-step cost-minimizing solution. The first step is to determine the costs associated with each method of classification. Each method should provide an identifiable benefit for classifying digital products. Because different methods conflict with one another, choosing method A instead of the conflicting method B will impose an opportunity cost equal to the benefits of

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<sup>112</sup> Hosuk Lee-Makiyama, *Future-Proofing World Trade in Technology: Turning the WTO IT Agreement (ITA) into the International Digital Economy Agreement (IDEA)*, 66 *AUSSENWIRTSCHAFT* 279 (2011); World Trade Organization, *supra* note 16.

<sup>113</sup> Stewart Baker recognizes that change is needed but argues that change should come from political negotiation rather than a high-level taxonomical change. Baker, *supra* note 12, at 10 (“[A] better outcome would be for the WTO Members to reach a negotiated solution that balances their interests.”). Andrew Mitchell argues that “[a]t a minimum, Members should amend GATS so that that agreement is more easily applied to electronic commerce.” Mitchell, *supra* note 38, at 722–23.

<sup>114</sup> Although a new regime could be future-proofed to some degree, the impetus for *sui generis* proposals has been to solve existing problems, not future problems.

<sup>115</sup> See Baker, *supra* note 12, at 6 (“[I]t is generally agreed that in order to avoid the need to develop an entirely new trade regime, e-products should not be classified as something other than goods or services.”) (citing *Work Programme on Electronic Commerce, Objectives for Treatment of Electronic Commerce, Communication from Australia*, WT/GC/24, at 2 (July 5, 1999)).

<sup>116</sup> From a theoretical standpoint, cost-minimization and benefit-maximization are the same thing. This Comment frames its analysis in terms of cost-minimization because, as discussed in the rest of this section, the intuitive effects of classification decisions present themselves as downsides or costs so a benefit-maximization framework would require burdensome use of double-negatives.

following method B. To be clear, “costs” in this context does not mean the actual monetary costs like tariffs imposed on importers and exporters.<sup>117</sup> This Comment focuses on the legal aspect of interpreting the GATT and GATS agreements so the relevant costs are measured in terms of the interpretive burden created by disregarding a given method of classification. These costs are evaluated below. The second step is to balance the total costs of classifying digital products as goods against the total costs of classifying digital products as services. The optimal classification is the one that minimizes total cost.

I begin with the formalistic method. The cost of using a classification that runs contrary to the definitions of goods and services, both dictionary and common usage, is an increase in transaction costs. Governments and businesses making ground-level decisions are more likely to intuitively follow a formalistic approach to classification, so any move away from this method will incur higher costs. Because the formalistic approach suggested classifying digital products as goods, we would expect a decision to classify digital products as services to confuse all parties who are inclined to apply the formalistic approach. The cost of overcoming this confusion is the relevant transaction cost. However, this cost may not actually be so high. The current system of classification of goods and services under the GATT and GATS is already far removed from the formal definitions of goods and services. Navigating existing GATT and GATS law already requires reference to WTO publications and precedent. The added transaction cost of not being able to rely on the dictionary when dealing in digital products seems negligible in comparison.

Ignoring the functional method of classification creates costs in the form of inconsistency. Because the likeness principle holds that similar products should be governed by the same terms, a movement away from the functional approach would lead to inequitable treatment of similar products. In theory, this could create a large cost by opening the door for case-by-case determinations and the potential for abuse inherent therein. But this Comment found that the likeness principle was unable to classify digital products as either goods or services. So in practice, inconsistency costs will arise no matter how digital products are classified. If inconsistency is unavoidable, then it is immaterial whether or not the functional approach is followed.

The cost of ignoring the purpose of the WTO agreements is substantial. According to the social theory of international trade, the WTO represents “a structure of collectively shared ideas about trade.”<sup>118</sup> One of these shared ideas, as expressed in the GATS preamble, is recognition of the relative disadvantages in

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<sup>117</sup> For example, an exporter of digital products would face higher costs, in the form of less liberal trade policies, if those products were considered services than if they were considered goods. This cost would be relevant for businesses but not for this Comment.

<sup>118</sup> Jane Ford, *A Social Theory of Trade Regime Change: GATT to WTO*, 4 INT'L STUD. REV. 115, 116 (2002).

the service sector borne by developing economies. Counterintuitive definitions and technical inconsistencies are unlikely to undermine an entire agreement, but an interpretive method that abandons the purpose of the agreement loses the consensus upon which the agreement was created.

Considering all three methods of classification, the cost of classifying digital products as goods outweighs the cost of classifying them as services. This approach therefore requires that digital products be treated as services governed by the GATS. Because the functional approach does not impose greater costs depending on how digital products are classified, total cost-minimization depends on a balancing of the costs of ignoring the formalist approach and the cost of ignoring the theoretical approach. This section has shown that the costs associated with the formalist approach are minimal and the costs associated with the theoretical approach are potentially quite large. Therefore, digital products should be classified according to the theoretical approach, making them services.

## VI. CONCLUSION

The growth of technology in general and the Internet in particular has presented a challenge of classification for international trade law. WTO law separates international trade into two categories: goods and services. Choosing the correct classification has a non-trivial impact on international conduct—WTO member states are able to impose significantly more protectionist restrictions on services than on goods. To better classify digital products, this Comment applied a three-part taxonomy. First, it looked at the definitions of “goods” and “services.” Using both dictionary definitions and common usage definitions, the Comment concluded that a formalistic interpretation of the GATT and GATS would suggest treating digital products as goods. Looking at practical concerns through the likeness doctrine did little to clarify how digital products ought to be classified. However, the purpose of the WTO shows that digital products should be treated as services. Balancing these three factors, this Comment concludes that the WTO should treat digital products as services and subject them to the GATS restrictions.