

# CLLOUD COMPUTING, CLICKWRAP AGREEMENTS, AND LIMITATION ON LIABILITY CLAUSES: A PERFECT STORM?

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## ABSTRACT

*“To the cloud!” trumpets a commercial by Microsoft, whose aim is to herd customers, and their checkbooks, into the cloud computing fold. But Microsoft, and other cloud providers like Amazon and Google, might inadvertently be doing just the opposite. It is not for lack of security or even early adopter apprehension that potential customers might turn away. Nor is it a lack of fantastic, cost-saving applications of cloud technology.*

*Rather, the problem is buried deep within these tech giants’ clickwrap agreements—the ones that customers rarely read and to which they invariably click “I Agree.” Hidden in these agreements are limitation on liability clauses, veritable safe harbors for cloud providers and submerged icebergs for the unwary cloud customer. Often, these clauses wholly abrogate a customer’s right to recover damages for his provider’s wrongful acts. In other words, a provider could purposefully delete its customers’ data or shut down its users’ websites, leaving the aggrieved customers with no cause of action and no right to recover.*

*While limitation on liability clauses are not new to the contract law vernacular, their inclusion in cloud computing agreements is particularly troublesome. The amount of potential liability that customers may waive through a half-cocked click is as enormous as it is troubling. While courts have recently held that these clauses are enforceable in other Internet-related areas, courts should be wary of blindly applying precedent and enforcing these clauses in the cloud computing context.*

## INTRODUCTION

As an April Fools’ Day joke, the British online gaming store GameStation made a clever adjustment to its license agreement.<sup>1</sup> The

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<sup>1</sup> Catharine Smith, *7,500 Online Shoppers Accidentally Sold Their Souls to Gamestation*, HUFFINGTON POST, Apr. 17, 2010,

modification notified customers that “[b]y placing an order via this Web site . . . you agree to grant [u]s a non transferable option to claim, for now and [forever] more, your immortal soul.”<sup>2</sup> Just below this language, GameStation included an escape clause for the vigilant—by clicking a different button, customers could avoid forfeiting their souls and would receive a £5 coupon.<sup>3</sup> Only 12% of customers managed to read closely enough to avoid hellfire and claim their coupons.<sup>4</sup>

While the clauses in cloud providers’ license agreements are not quite so onerous, they do snatch up rights that most cloud customers would certainly consider important. One variety of clause in particular may prove to slow the cloud market’s growth: the limitation on liability clause.<sup>5</sup> These clauses, usually buried deep<sup>6</sup> within a cloud provider’s click-wrap agreement,<sup>7</sup> limit the damages an aggrieved customer can recover from a cloud provider<sup>8</sup> or dispense with a customer’s ability to recover altogether.<sup>9</sup>

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[http://www.huffingtonpost.com/2010/04/17/gamestation-grabs-souls-o\\_n\\_541549.html](http://www.huffingtonpost.com/2010/04/17/gamestation-grabs-souls-o_n_541549.html).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

<sup>5</sup> For an interesting discussion on the implications of limitation on liability clauses in non-digital contracts, see WARRANTIES AND DISCLAIMERS: LIMITATION OF LIABILITY IN CONSUMER-RELATED TRANSACTIONS 15–30 (Martin Kurer et al. eds., 2002).

<sup>6</sup> See, e.g., *The Rackspace Cloud Terms of Service*, RACKSPACE, <http://www.rackspacecloud.com/legal/> (last updated Jan. 24, 2011) (including a “Limitation on Damages” provision in clause 17 of a 29–clause clickwrap agreement); *Google App Engine Terms of Service*, GOOGLE, <http://code.google.com/appengine/terms.html> (last visited Sept. 25, 2011) (including a “Limitation of Liability” clause in section 12 of its 17–section agreement).

<sup>7</sup> Clickwrap agreements are contracts formed entirely over the Internet which set forth the rights between service users and service providers. The term “click-wrap” is derived from the fact that many of these online agreements require a user to click a button or link to agree to the contract. Francis M. Buono & Jonathan A. Friedman, *Maximizing the Enforceability of Click-Wrap Agreements*, 4 J. TECH. L. & POL’Y 3, ¶1 (1999).

<sup>8</sup> See *The Rackspace Cloud Terms of Service*, RACKSPACE, <http://www.rackspacecloud.com/legal/> (last updated Jan. 24, 2011) (limiting a customer’s damages to “greater of (i) the amount of fees you paid for the Services for the six months prior to the occurrence of the event giving rise to the claim, or (ii) Five Hundred Dollars” (emphasis omitted)).

<sup>9</sup> See *Google App Engine Terms of Service*, GOOGLE, <http://code.google.com/appengine/terms.html> (last visited Sept. 25, 2011) (“Google . . . shall not be liable to you for any direct, indirect, incidental, special consequential or exemplary

Recently, courts have begun to enforce limitation on liability clauses in click-wrap agreements,<sup>10</sup> but the use of these clauses presents troubling new concerns because of the high value and volume of data stored in the cloud. By assenting to these agreements, cloud customers are clicking away more of their legal rights than they might think. If these clauses—and the subsequent inadequacy of remedies available to customers—are brought into the spotlight through litigation, potential cloud customers may choose not to use the cloud, and current customers might reconsider their reliance on cloud services. In short, risk aversion could freeze the market. To avoid such a scenario, courts must analyze these agreements from a fresh perspective while resisting the myopic temptation to strictly adhere to precedent.

Comprehending the depth and breadth of the problem caused by conflating basic clickwrap agreements with the cloud requires a cursory understanding of each of the contributing terms. As such, Section I of this Issue Brief will describe cloud computing and how cloud providers and customers interact. Next, Section II will discuss clickwrap agreements and the evolution of their enforceability in the courts. Finally, Section III will analyze how the components combine to create a real problem—that is, how clickwrap agreements in cloud computer contracts can abrogate cloud customers’ legal rights. This Issue Brief will conclude with suggestions regarding how the public and the judiciary can help combat this problem.

## I. THE FIRST COMPONENT OF DISASTER: THE CLOUD

Identifying a precise definition of cloud computing is not easy.<sup>11</sup> Some have even pontificated that giving shape to the exact contours of cloud computing is as difficult “as attempting to capture a genuine cloud

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damages which may be incurred by you, however caused and under any theory of liability.” (emphasis omitted)).

<sup>10</sup> See Nathan J. Davis, Note, *Presumed Assent: The Judicial Acceptance of Clickwrap*, 22 BERKELEY TECH. L.J. 577, 579 (2007) (“[C]ourts have unanimously found that clicking is a valid way to manifest assent since the first clickwrap agreement was litigated in 1998. . . . [A]bsent fraud or deception, the user’s failure to read, carefully consider, or otherwise recognize the binding effect of clicking ‘I Agree’ will not preclude the court from finding assent to the terms.”).

<sup>11</sup> See, e.g., Matthew A. Verga, *Cloudburst: What Does Cloud Computing Mean to Lawyers?*, 5 J. LEGAL TECH. RISK MGMT. 41, 42 (2010) (“As Larry Ellison, CEO of the computer technology company Oracle, put it: ‘The interesting thing about cloud computing is that we’ve redefined cloud computing to include everything that we already do. I can’t think of anything that isn’t cloud computing . . . .’”); Jeremy Geelan, *Twenty One Experts Define Cloud Computing*, VIRTUALIZATION J. (Jan. 24, 2009, 6:15 AM), <http://virtualization.sys-con.com/node/612375> (presenting 21 industry experts’ widely varying definitions of cloud computing).

with one's hands.”<sup>12</sup> Nonetheless, many public and private agencies have attempted to do so.<sup>13</sup> Regrettably, the federal government's definition of cloud computing is anything but clear. According to the National Institute of Standards and Technology (NIST),

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models.<sup>14</sup>

To the technologically uninitiated, this definition leaves much unanswered. Perhaps the best way to introduce the concept of cloud computing is through analogy. Think of cloud computing as a utility service,<sup>15</sup> much like an electric utility service. With an electric utility, the parties involved are the providers—large companies that provide the service—and the customers—individuals and businesses that use and pay for the service. The same basic model exists in cloud computing.<sup>16</sup> Tech companies like Google, Microsoft, and Amazon are *cloud providers*.<sup>17</sup>

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<sup>12</sup> David S. Barnhill, Note, *Cloud Computing and Stored Communications: Another Look at Quon v. Arch Wireless*, 25 BERKELEY TECH. L.J. 621, 638 (2010).

<sup>13</sup> Geelan, *supra* note 11.

<sup>14</sup> Peter Mell & Tim Grance, *The NIST Definition of Cloud Computing, Version 15*, NIST.GOV, (Oct. 7, 2009), available at <http://www.nist.gov/itl/cloud/upload/cloud-def-v15.pdf> (emphasis omitted).

<sup>15</sup> Michael Armbrust, Armando Fox, Rean Griffith, Anthony D. Joseph, Randy Katz, Andy Konwinski, Gunho Lee, David Patterson, Ariel Rabkin, Ion Stoica & Matei Zaharia, *Above the Clouds: A Berkeley View of Cloud Computing*, UC BERKELEY EECS 1 (Feb. 10, 2009), <http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf> (describing cloud computing as “the long-held dream of computing as a utility”).

<sup>16</sup> Some commentators discuss three parties involved in cloud computing instead of two. In this dichotomy, the group labeled as “cloud providers” is further subdivided into “service providers” and “infrastructure providers.” See, e.g., Luis M. Vaquero, Luis Rodero-Merino, Juan Caceres & Maik Lindner, *A Break in the Clouds: Towards a Cloud Definition*, ACM SIGCOMM COMPUTER COMM. REV., Jan. 2009, at 50, 51, available at <ftp://doc.nit.ac.ir/cee/jazayeri/research%20method/a%20break%20in%20the%20clouds%20towards%20a%20cloud%20definition.pdf> (describing three actors in cloud computing as service users, service providers, and infrastructure providers). This further subdivision will be omitted in this Note because it is unnecessary to the understanding of the issues at hand and would likely lead to confusion.

<sup>17</sup> Brandon Watson, *Amazon, Google, Microsoft - Big Three Cloud Providers Examined*, CLOUD COMPUTING J. (Apr. 21, 2009, 10:00 PM),

Individual users and businesses that utilize the providers' services are *cloud customers*.

Continuing the analogy, just as electric providers supply electricity to their customers, cloud computing providers supply computing resources to their customers.<sup>18</sup> The scope and type of computing resources may vary from provider to provider, but most offer three main resources—CPU time, data storage, and bandwidth.<sup>19</sup> Customers use a provider's CPU time utility when they use the provider's servers and processors to complete tasks<sup>20</sup> like sorting data or compressing video files. Customers use the data storage utility when they use the provider's hard drives and memory to store their data.<sup>21</sup> Finally, customers use a provider's bandwidth utility when they transfer their data from an outside location to the provider's network or from the network to an outside location.<sup>22</sup>

Cloud customers combine these three primary resources in ways that correspond to their business goals. For instance, many customers use cloud services to host their websites.<sup>23</sup> Others may use the cloud to store and manipulate scientific data.<sup>24</sup> Amazon suggests that its services match well with the needs of “Pharma companies, Biotech companies, research

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<http://cloudcomputing.sys-con.com/node/746859> (describing the ways in which Amazon, Google, and Microsoft differ in their service offerings).

<sup>18</sup> See Vaquero et al., *supra* note 16, at 51 (“Clouds are a large pool of easily usable and accessible virtualized resources (such as hardware, development platforms and/or services.”).

<sup>19</sup> See Armbrust et al., *supra* note 15, at 5 (describing Amazon cloud service's main service offerings).

<sup>20</sup> See Conference Proceedings, Ang Li, Xiaowei Yang, Srikanth Kandula & Ming Zhang, *CloudCmp: Shopping for a Cloud Made Easy*, 2nd USENIX Workshop on Hot Topics in Cloud Computing (June 22–25, 2010) at § 2.1, available at [http://www.usenix.org/events/hotcloud10/tech/full\\_papers/Li.pdf](http://www.usenix.org/events/hotcloud10/tech/full_papers/Li.pdf) (“A compute cluster . . . host[s] and run[s] a customer's application code.”).

<sup>21</sup> See *id.* § 2.2 (“Cloud providers . . . offer persistent storage services that store the dynamic application data . . .”).

<sup>22</sup> See *id.* §§ 2.3–2.4 (“Charges for using the wide-area delivery network are based on the amount of data delivered through the cloud boundaries to the end users.”).

<sup>23</sup> Jennifer Marsman, *When Does Cloud Computing Make Sense?*, MSDN BLOGS (June 12, 2010, 2:05 PM), <http://blogs.msdn.com/b/jennifer/archive/2010/06/12/when-does-cloud-computing-make-sense.aspx> (last visited Sept. 25, 2011).

<sup>24</sup> See *1000 Genomes Project*, AMAZON, [http://aws.amazon.com/datasets/4383?\\_encoding=UTF8&jiveRedirect=1](http://aws.amazon.com/datasets/4383?_encoding=UTF8&jiveRedirect=1) (last visited Sept. 25, 2011) (describing a customer's project that uses the cloud to derive and store the human genome).

centers and academic laboratories”—customers that will store valuable scientific data in the cloud.<sup>25</sup>

## II. THE SECOND COMPONENT OF DISASTER: CLICKWRAP AGREEMENTS AND LIMITATION ON LIABILITY CLAUSES

Frequently utilized in online transactions, clickwrap agreements define the scope of the contractual relationship between the customer and service provider.<sup>26</sup> These agreements usually contain a variety of clauses, some of which restrict the actions and rights of the service provider<sup>27</sup> while others place limits on the customer.<sup>28</sup>

Limitation on liability clauses fall squarely within the latter category and vary widely in severity. Some wholly abrogate a customer's right to recover any damages from the service provider, regardless of the cause of the damage,<sup>29</sup> while others limit a customer's maximum possible recovery in litigation.<sup>30</sup> In either case, clauses that disclaim liabilities are among the most controversial clickwrap agreement provisions.<sup>31</sup>

In the early days of the Internet, courts usually refused to enforce contracts that were designed to abrogate liability.<sup>32</sup> Viewing these agreements through the lens of contract law, judges either held them to be unenforceable contracts of adhesion or found particular terms to be

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<sup>25</sup> *Life Sciences*, AMAZON, <http://aws.amazon.com/lifesciences/> (last visited Sept. 25, 2011).

<sup>26</sup> Garry L. Founds, Note, *Shrinkwrap and Clickwrap Agreements: 2B or Not 2B?*, 52 FED. COMM. L.J. 99, 101 (1999).

<sup>27</sup> *Amazon Web Services Customer Agreement*, AMAZON, <http://aws.amazon.com/agreement/> (last visited Sept. 25, 2011) (denying Amazon's right to any intellectual property placed on its servers by its customers).

<sup>28</sup> *Id.* (claiming that Amazon can suspend a customer's account upon nonpayment or breach of the contract).

<sup>29</sup> See *supra* note 9 and accompanying text.

<sup>30</sup> See *supra* note 10 and accompanying text.

<sup>31</sup> Davis, *supra* note 10, at 578.

<sup>32</sup> See, e.g., *Step-Saver Data Sys., Inc. v. Wyse Tech.*, 939 F.2d 91, 99 (3d Cir. 1991) (finding that a clickwrap agreement was unenforceable due to lack of affirmative assent); *Foresight Res. Corp. v. Pfortmiller*, 719 F. Supp. 1006, 1010 (D. Kan. 1989) (noting that “there is some reason to question the enforceability of any such agreement”).

unconscionable.<sup>33</sup> Recent court decisions, however, signal a jurisprudential shift towards a willingness to enforce these contracts.<sup>34</sup>

In *Treiber & Straub, Inc. v. United Parcel Service, Inc.*,<sup>35</sup> for example, the court enforced a limitation on liability clause in UPS's clickwrap agreement.<sup>36</sup> The clause at issue stated that UPS's liability would be limited to \$100 if it lost a package of "unusual value."<sup>37</sup> The plaintiff in the case had agreed to the terms of UPS's lengthy online agreement before shipping a piece of jewelry worth over \$100,000.<sup>38</sup> When UPS lost that package, the court held that UPS had validly limited its liability through its clickwrap agreement.<sup>39</sup> The clear terms of the agreement had limited the plaintiff's recovery to \$100—only 0.1% of the loss suffered by the plaintiff.<sup>40</sup>

This shift toward the enforcement of limitation on liability clauses is particularly disturbing in the context of cloud computing agreements. Indeed, the \$100,000 loss in the UPS case is a paltry sum when compared to the potential liability cloud providers could face for their transgressions in the cloud.

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<sup>33</sup> *Vault Corp. v. Quaid Software Ltd.*, 655 F. Supp. 750, 762-63 (E.D. La. 1987) (finding that a shrinkwrap agreement was an unenforceable contract of adhesion under basic contract law); *Founds*, *supra* note 26, at 101.

<sup>34</sup> *See, e.g., XPEL Techs. Corp. v. Md. Performance Works Ltd.*, No. SA-05-CA-0593-XR, 2006 WL 1851703 at \*7-8 (W.D. Tex. May 19, 2006) (holding a choice of forum provision in a clickwrap agreement enforceable based upon evidence of assent through clicking); *i.Lan Sys., Inc. v. NetScout Serv. Level Corp.*, 183 F. Supp. 2d 328, 336-39 (D. Mass. 2002) (stating that a limitation on liability clause in a clickwrap agreement should be enforceable); *Hotmail Corp. v. Van\$ Money Pie, Inc.*, No. C-98 JW PVT ENE, C 98-20064 JW, 1998 WL 388389 at \*6 (N.D. Cal. Apr. 16, 1998) (upholding the validity of a clickwrap license as a whole).

<sup>35</sup> *Treiber & Straub, Inc. v. United Parcel Serv., Inc.*, No. 04-C-0069, 2005 WL 2108081 (E.D. Wis. Aug. 31, 2005).

<sup>36</sup> *Id.* at \*7-8.

<sup>37</sup> *Id.* at \*4.

<sup>38</sup> *Id.* at \*3-4.

<sup>39</sup> *Id.* at \*12.

<sup>40</sup> *Id.* at \*7-8 (holding that the liability of liability clause was "reasonable and the plaintiff is, therefore, bound by the limitation of liability").

### III. THE CONTOURS OF THE PROBLEM: COMBINING LIMITATION ON LIABILITY CLAUSES WITH CLOUD COMPUTING SERVICES

#### A. The Danger: Cloud Providers Make Potentially Huge Mistakes

Cloud providers go to great lengths to provide reliable services to their customers. For instance, most providers use redundancy<sup>41</sup> to stave off service outages and ensure that customer data is safe from loss. Yet despite these precautions, server crashes, hard drive failures, and other disasters do occur, and customers suffer the consequences. In October of 2009, Microsoft proved just this point when its cloud experienced a catastrophic failure. Mobile phone users stored their contacts, calendars, and other data on Microsoft's cloud.<sup>42</sup> After suffering a series of failures in their cloud facility, Microsoft sent the following chilling message to its cloud customers: "Regrettably, based on [Microsoft's] latest recovery assessment of their systems, we must now inform you that personal information stored [in our cloud] almost certainly has been lost as a result of a server failure at [Microsoft]."<sup>43</sup>

More recently, Gmail, Google's cloud-based email service, has proven that the dangers of data loss in the cloud still exist, even for customers of one of the most sophisticated cloud providers in the world.<sup>44</sup> Due to a set of botched software updates, over 160,000 users' email accounts were deleted in February 2011.<sup>45</sup> Although Google was eventually able to restore the data, their customer's accounts were unavailable for days.<sup>46</sup> Alarming, 85% of workers under the age of twenty-five use

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<sup>41</sup> Redundancy, an age-old computer science virtue, refers to maintaining a secondary peripheral or computer device that can take over if the primary component fails. REDUNDANCY TECHNIQUES FOR COMPUTING SYSTEMS (William C. Mann & Richard H. Wilcox, eds., 1962); *see also Is Your DAM Thinking in the Cloud?*, HONEYCOMB ARCHIVE, <http://www.honeycombarchive.com/cloud-digital-asset-management.cfm> (last visited Sept. 25, 2011) ("Most Cloud services maintain data in up to three separate locations. This is an excellent redundancy, should there be an internet outage or data center disaster. The data is readily available from the other Cloud locations without an interruption in service.").

<sup>42</sup> Daniel Eran Dilger, *Microsoft's Danger Sidekick Data Loss Casts Dark on Cloud Computing*, APPLEINSIDER (Oct. 11, 2009, 4:55 PM), [http://www.appleinsider.com/articles/09/10/11/microsofts\\_danger\\_sidekick\\_data\\_loss\\_casts\\_dark\\_on\\_cloud\\_computing.html](http://www.appleinsider.com/articles/09/10/11/microsofts_danger_sidekick_data_loss_casts_dark_on_cloud_computing.html).

<sup>43</sup> *Id.* (emphasis omitted).

<sup>44</sup> *Gmail Failure Hits 160,000 Users – Some Still Affected*, INFOSECURITY, (Mar. 1, 2011), <http://www.infosecurity-magazine.com/view/16278/gmail-failure-hits-160000-users-some-still-affected>.

<sup>45</sup> *Id.*

<sup>46</sup> *See Ben Treynor, Gmail Back Soon for Everyone*, GMAIL BLOG (Feb. 28, 2011, 6:30 PM), <http://gmailblog.blogspot.com/2011/02/gmail-back-soon-for-everyone>



Gmail to send work-related emails “containing potentially sensitive information.”<sup>47</sup> Users’ willingness to store such important business information in the cloud—together with the cloud’s proven fragility—effectively illustrates the enormity of this budding issue.

While losing cell phone contact lists and emails might not set off too many alarm bells, companies storing scientific research in the cloud have much more at stake. For example, the 1000 Genomes Project, an initiative aimed at “build[ing] the most detailed map of human genetic variation to date,” retains Amazon’s cloud services to perform computation on and store its research.<sup>48</sup> The Project currently houses 7.3 terabytes worth of data on Amazon’s servers,<sup>49</sup> almost as much data as the entire printed collection in the Library of Congress.<sup>50</sup> The loss of this data would be catastrophic not only to the progress of the Project, but also to the progress of the science of genetics in general.

Similarly, companies that choose to have cloud providers host their websites could suffer substantial revenue loss due to potential service outages. Domino’s Pizza is one such company—it is currently working with Microsoft to host their online pizza ordering website in the cloud.<sup>51</sup> To date, Domino’s has received over \$1 billion in sales through its website.<sup>52</sup> As a consequence, losing service for even a few hours could effectuate losses in the millions of dollars. Losses could be even more severe if the outage occurred during a high-load time like the Super Bowl.<sup>53</sup> If companies similar to Domino’s acquiesce to clickwrap agreements containing limitation on liability clauses, those companies would have no

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everyone.html (noting that the accounts were lost on February 27 and access was not restored for all until late on March 2).

<sup>47</sup> Warwick Ashford, *Gmail Failure Highlights Risks of Web-Based E-mail*, COMPUTERWEEKLY.COM (Mar. 1, 2011), <http://www.computerweekly.com/Articles/2011/03/01/245663/Gmail-failure-highlights-risks-of-web-based-e-mail.htm>.

<sup>48</sup> *1000 Genomes Project*, AMAZON, [http://aws.amazon.com/datasets/4383?\\_encoding=UTF8&jiveRedirect=1](http://aws.amazon.com/datasets/4383?_encoding=UTF8&jiveRedirect=1) (last visited Sept. 25, 2011).

<sup>49</sup> *Id.*

<sup>50</sup> *Megabytes, Gigabytes, Terabytes . . . What Are They?*, WHAT’S A BYTE, <http://www.whatsabyte.com/> (last visited Sept. 25, 2011).

<sup>51</sup> Marsman, *supra* note 23.

<sup>52</sup> Bob Evans, *Microsoft Cloud Gets \$1 Billion Delivery from Domino’s*, INFORMATIONWEEK GLOBAL CIO BLOG (Mar. 9, 2010, 1:53 PM), [http://www.informationweek.com/blog/main/archives/2010/03/microsoft\\_cloud\\_2.html](http://www.informationweek.com/blog/main/archives/2010/03/microsoft_cloud_2.html).

<sup>53</sup> John Wilen, *Super Bowl’s Big Day for TV, Pizza Sales*, USA TODAY (Jan. 31, 2008, 5:41 AM), [http://www.usatoday.com/money/economy/2008-01-30-300991490\\_x.htm](http://www.usatoday.com/money/economy/2008-01-30-300991490_x.htm) (“Domino’s Pizza sales jump 30 percent on Super Bowl Sunday compared to a typical Sunday . . .”).

recourse through which to recoup damages from their cloud providers, even if those providers were extraordinarily negligent.

Cloud service use will likely not be confined to less vital industries like pizza delivery for long.<sup>54</sup> India's Bombay Stock Exchange already stores some of its less critical data in the cloud and expects to serve more data and users from the cloud within the next five years.<sup>55</sup> Commentators in England have begun clamoring for the London Stock Exchange to utilize more cloud services.<sup>56</sup> Migration of American financial market data and trading services may soon be moving to the cloud as well.<sup>57</sup> As such, a service outage for a major stock exchange would be devastating to the national—and possibly the global—economy. A clickwrap-based restriction on recovering losses from a cloud provider who might negligently cause such staggering damages borders on the absurd.

Cloud customers with so much at stake ought to possess sufficient bargaining power to have limitation on liability clauses removed from their contracts.<sup>58</sup> Yet small start-up businesses with significant quantities of valuable information do not have this luxury and are often left with a boilerplate clickwrap agreement.<sup>59</sup> This begs the question: what if Mark Zuckerberg had originally decided to host Facebook in the cloud? Zuckerberg, then a college student, would have had no choice but to agree

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<sup>54</sup> The cloud computing market accounted for \$68.3 billion in revenue in 2010 and is expected to grow by an extremely healthy 20% per year to \$148.8 billion by 2014. Press Release, Gartner, Gartner Says Worldwide Cloud Services Market to Surpass \$68 Billion in 2010 (Jun. 22, 2010), available at <http://www.gartner.com/it/page.jsp?id=1389313>.

<sup>55</sup> Penny Jones, *Indian Cloud Perspectives*, DATACENTERDYNAMICS (Mar. 24, 2011), <http://www.datacenterdynamics.com/focus/archive/2011/03/indian-cloud-perspectives>.

<sup>56</sup> See, e.g., Jim Anderson, *London Stock Exchange Glitch—Could Cloud Computing Have Saved the Day?*, THE ACCIDENTAL SUCCESSFUL CIO (Sept. 15, 2008, 9:02 AM), <http://www.theaccidentalsuccessfulcio.com/uncategorized/london-stock-exchange-glitch-could-cloud-computing-have-saved-the-day>.

<sup>57</sup> See, e.g., *NASDAQ Data-on-demand*, NASDAQ, <https://data.nasdaq.com/DOD.aspx> (last visited Mar. 15, 2012) (“NASDAQ Data-On-Demand is a new cloud computing solution . . . that provides easy and flexible access to large amounts of high quality and reliable historical Level 1 data for NASDAQ[], NYSE[], OTC Bulletin Board (OTCBB), Pinksheet and other regional-listed securities.”).

<sup>58</sup> Unfortunately, access to these contracts is not available to the public; confirming this suspicion is not possible.

<sup>59</sup> See, e.g., *Arthur Miller Dance Studios of Cleveland, Inc. v. Witter*, 105 N.E.2d 685, 704 (Ohio Ct. Com. Pl. 1952) (describing how a party with less bargaining power may be “in no position to object to boiler plate restrictive covenants placed before him to sign”).

to the provider's clickwrap agreement and would have been given absolutely no opportunity to negotiate. If negligence on behalf of a cloud provider had then stifled Facebook's success, Zuckerberg would have been unable to recover any damages. Currently, analysts estimate the value of Zuckerberg's little startup to be \$50 billion.<sup>60</sup> As such, not allowing startups to collect damages due to a clause in a clickwrap agreement is beyond the scope of allowable risk. Given the astronomical potential liability that exists in this area, these clauses should be examined closely by the judiciary and should not be present in cloud computing contracts in the first instance.

### B. A Long-Term and Short-Term Solution: Information and Fresh Judicial Review

Thus far, the cloud computing market has allowed these limitations on liability clauses to perpetuate. The proper inquiry now is whether customers are aware of their diminished rights<sup>61</sup> and, if not, whether customers would tolerate these clauses if they knew about them.

Increasing awareness, then, is a necessary strategy. Informing cloud customers that they have little or no ability to recover damages resulting from their providers' negligent or even knowingly wanton acts might lead more customers to attempt to avoid these clauses. Further, if all customers knew about these clauses, they would likely be unwilling to pay as much for cloud services.<sup>62</sup> In response to falling prices, cloud providers might relax their limitation on liability clauses or even remove them altogether.

Removal of the limitation on liability clauses would likely cause prices for cloud computing services to increase. Since cloud providers will be more vulnerable to liability, they may charge their customers more to

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<sup>60</sup> Tom Foreman, *How Much Is Facebook Really Worth?*, (Mar. 8, 2011) CNN, [http://articles.cnn.com/2011-03-08/tech/facebook.overvalued\\_1\\_mark-zuckerberg-facebook-worldwide-users?\\_s=PM:TECH](http://articles.cnn.com/2011-03-08/tech/facebook.overvalued_1_mark-zuckerberg-facebook-worldwide-users?_s=PM:TECH).

<sup>61</sup> See Smith, *supra* notes 1–4 and accompanying text (noting that in the case of one clickwrap agreement, 88% of users failed to read the online contract before agreeing to it). It is unclear how many cloud customers are actually aware of their limited rights to sue for damages under cloud license agreements.

<sup>62</sup> See Ronald J. Gilson & Reiner H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 561–65 (1984) (describing the mechanisms by which market prices move with inflows of new information—slower movement for narrow dissemination of information, faster movement for wider dissemination). If high-profile litigation on these clauses occurred, then one would expect the prices of cloud computing services to drop relatively quickly. See *id.* If, on the other hand, information were spread word-of-mouth, prices would not move with such alacrity. See *id.*

cover the costs of future adverse judgments. In the end, the free market will dictate how much the removal of these clauses is worth to cloud customers. For now, it seems likely that the market could become bifurcated: one set of cloud providers could continue to include limitation on liability clauses and cater to customers who do not store valuable data in the cloud, while the other set could remove the clauses and sell services to those who entrust cloud providers with valuable data.

Market shifts through information take time, however. In the interim, the gap between full public information and the cloud market's response should be filled with renewed scrutiny of limitation on liability clauses by the judiciary. Indeed, the potential scope of liability assumed by cloud providers is much broader<sup>63</sup> than liability found in other online arenas where limitation on liability clauses are routinely used. Because of the disparity between potential liability in the cloud and liability in other Internet markets, precedent urging the enforcement of clickwrap agreements should not be followed by judges in the cloud context. Alternatively, rejuvenation of the doctrine of unconscionability would help cloud customers avoid waiving their important legal rights.<sup>64</sup> Just as courts used unconscionability to strike down onerous clauses during the early days of the Internet, the same should be done during the infancy of cloud computing. In rejuvenating this doctrine, the courts might prevent harm to the cloud computing market while providing adequate safeguards to its customers.

#### CONCLUSION

As more consumers join the cloud computing revolution and use of the cloud becomes ubiquitous, the likelihood of data-eliminating and service-interrupting mistakes by cloud providers will continue to increase. Unfortunately, customers who are bound by limitation on liability clauses through clickwrap agreements may not be able to recover any damages at all. In the past, courts have been willing to enforce such clauses.<sup>65</sup> Nevertheless, because the customer's potential damages in the cloud are much greater than in other areas, courts should examine these clauses closely and refuse to blindly apply precedent that is incapable of fully addressing the wide-ranging and unique implications of the cloud.

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<sup>63</sup> See *supra* Part III.A.

<sup>64</sup> For a good primer on the doctrine of unconscionability, see Amy J. Schmitz, *Embracing Unconscionability's Safety Net Function*, 58 ALA. L. REV. 73 (2006).

<sup>65</sup> See *supra* notes 34–40 and accompanying text.