

## **Part 5**

### **Technology, Ethics and Legal Norms**



## Chapter 16

### A Face in the Cloud? – Identifying Moral Issues and Constraints in Cloud-Based Image Storage

*Wybo Houkes*

Our lives are rapidly becoming more digitized. Focusing only on entertainment: many people still buy paperback crime novels, some might still buy newly released music on CD, and a rare few might even buy movie DVDs. Yet many of these purchases will be made online; and for all these goods there are now alternatives or ‘substitutes’ that offer the same content in a digital, often more easily accessible format. The recent pandemic, the most disruptive global event in decades, has only accelerated the pace of digitization and extended it to more domains. Reflection on any aspect of the wide-ranging, varied, and most likely fundamental repercussions of digitization is therefore urgently needed, from the broadest possible variety of disciplinary perspectives.

In line with the theme of this volume, this chapter considers how digitization affects our involvement with images. These effects are again wide-ranging. Here, I focus on the increasing use of what I label ‘cloud-based image storage’: cloud-based services to store, organize and share images, such as Amazon Prime Photos, Apple Photos, Flickr, Instagram, or Google Photos. More specifically, I will investigate the increasing use of such services for personal images, such as family photos. This trend has economic and legal aspects and has been studied from – to name but a few – a design perspective (focusing on user-friendliness or effectiveness of the technology), a business perspective (focusing on commercial viability), or a sociological perspective (focusing on changes in practices of use). This chapter will touch upon all these aspects and perspectives, but primarily explore the use of photo cloud storage from a *moral* perspective. I will focus on actions associated with personal images and cloud storage, such as curating collections of images, sharing them with others, and removing them from storage. My guiding questions will be: which actions should users be entitled to perform? Which actions should others (such as service providers) not be entitled to perform? How should services be organized to ensure basic user/consumer rights? I seek general answers to these questions which will provide guidelines for evaluating services

without evaluating a specific service. Because of the explorative character of the chapter, there will be no more than a passing reference to existing services. My primary aim is to show that there are genuine and relatively pressing ethical issues concerning photo cloud storage, and to demonstrate how such issues can be discussed while taking into account some of the economic, sociological and legal complexities involved.

The chapter is organized as follows. After making some necessary preliminary distinctions concerning digitization (I.) and describing photo cloud storage in general terms (II.), I turn to moral analysis of these services. A first step is to apply a continuity heuristic to balance the rights between the parties involved (III.). This continuity is attractive from a usability perspective and may also be factored into ethical and legal rules concerning the rights of providers and users. Yet it leads to conceptual difficulties in specifying what continuity involves. After proposing a specification at the level of basic user activities, in a second step (IV.), I develop a set of moral constraints on cloud-based image storage, resulting from the function of collections of personal images as ‘technologies of memory’,<sup>1</sup> supporting formation of and reflection on individual and collective identity. I identify such constraints for the basic activities of accumulating, accessing, curating, and deleting personal images in cloud-based storage. Some conclusions are to be found in V.

## *I. Digitization in Economic Transactions*

Before discussing photo cloud storage, some preliminary distinctions regarding the phenomenon of digitization are needed. Precisely because of its wide-ranging and complex nature, it is important to differentiate its many aspects and instances. Without doing so, there is a risk that discussions of salient aspects of digitization become side-tracked and evolve into discussions of related phenomena, ideological trends, or historical continuities. I want to focus on aspects of digitization that make specific moral differences, rather than on their relation to globalization or capitalism and consumerism.

Rather than attempting to find a comprehensive definition or set of characteristics, I focus on the digitization of simple economic transactions, such as purchasing a crime novel, ordering food or subscribing to a streaming service. At least three distinctions can be made here, all which contrast

---

1 Van House/Churchill (2008).

‘digitized’ transactions with ‘non-digitized’ ones and are orthogonal to each other. These three distinctions are also orthogonal to the more standard economic distinction between *goods* – transferable items that provide utility, produced by some and consumed by others – and *services* – non-transferable items used by some and provided by others.

One distinction, which concerns the environment, is that between *on-line* and *offline* transactions. One might purchase goods in an online environment such as eBay rather than at a local bookstore. Another distinction concerns the goods or, more broadly, items involved in the transaction: they may be *digital* or physical, e.g., the e-book version of Colin Dexter’s *The Daughters of Cain* and a paperback print version, respectively. Thirdly, and perhaps least conspicuously, there is a distinction that has become an integral part of the transition to a digital economy, although it has much older roots. This concerns the format of the transaction itself: rather than a one-off or *singular* transaction, these are *subscription-based*, i.e., involve a recurring fee rather than a single payment. These transactions may involve regular deliverance of goods (say, fresh pairs of socks every month) or unlimited access to a repository of products, such as that offered by Netflix. Moreover, fees may be a flat-rate or proportional to usage, or subscription-based transactions may be free of charge to the user (initially, to some extent, or entirely).

The table below (Table 1) illustrates these distinctions and shows that they are to some extent independent of each other, by identifying a transaction that is an example of each possible type.

Another useful notion when analysing digitization of transactions is *substitutivity*. This is often applied to goods, such as brands of coffee, but I will use it to include services. Substitutive digitized transactions compete directly with (some set of) non-digitized transactions. Indeed, engaging in the former makes it far less likely that one will engage in the latter. The substitutive effects of digitization are well-known (go ask at your local record store if you are not convinced); a point of contention, to be discussed in the next section, is to what extent digitization leads to overall added value for the parties involved.

Type	Environment	Item	Transaction	Example
1	Offline	Physical	Singular	Purchasing a <i>Brothers in Arms</i> CD at the record store two blocks away
2	Offline	Physical	Subscription	Purchasing a subscription to the paper version of <i>Anglers Journal</i>
3	Offline	Digital	Singular	Purchasing <i>The Daughters of Cain</i> and uploading it to your e-reader at the local bookstore
4	Offline	Digital	Subscription	Purchasing a gift card for access to Spotify Premium at the local supermarket
5	Online	Physical	Singular	Purchasing sheep on AliBaba
6	Online	Physical	Subscription	Purchasing a subscription for printer paper on Amazon
7	Online	Digital	Singular	Purchasing a pdf of Houkes (2018) at the publisher's website
8	Online	Digital	Subscription	Purchasing a subscription to Apple Music

Table 1: A typology of transactions

II. ‘Servitization’ and Cloud-Based Image Storage

With the distinctions of the previous section in place, this section highlights some aspects of cloud-based image storage that might make a moral difference. In a nutshell: the transactions involved in cloud-based image storage involve digital items, an online environment, and are subscription-based. They are thus, examples of what are labelled ‘Type-8’ transactions in Table 1. As such, they are maximally different from transactions that were once central to our involvement with personal images, which involved physical goods such as printed photos, purchased at photographers’ stores or drugstores in singular transactions – *Type-1 transactions* in Table 1. Moreover, Type-8 transactions have to a large – and still growing – extent replaced Type-1 transactions. This section will schematically describe how this replacement occurred and highlights the evolving nature of transactions.

Some readers may, like the author, be old enough to remember home slide shows. Other than contemporary events that go by the same name (e.g., in PowerPoint), these involved mechanical projectors, stacks of small, framed transparencies and portable projection screens. Interestingly, in their basic set-up – the arrangement of equipment, the presence of an audience – there are strong continuities with the magic-lantern demonstrations used for entirely different purposes by Athanasius Kircher in the 17<sup>th</sup>

century<sup>2</sup> or the Royal Geographical Society in the late 19<sup>th</sup> century.<sup>3</sup> By contrast, nowadays, sharing a set of images with one's family might be as simple as sending them a link to a selection of cloud-stored images. This allows them to browse through the images whenever (if ever) they like, using any equipment that provides access to the digitized images, at any location where such equipment may be used. Leaving aside the user experience and practice of viewing, comparing the home slide show and the cloud-stored album highlight all three aspects of the taxonomy presented in section I., as well as the (highly schematized) stages of digitization.

In terms of the product, the slide show featured transparencies, high-resolution positive photographs with a standard size of 35 millimetres held inside a plastic frame. Most consumers of these goods obtained them from specialized photography shops or drugstores, where rolls of photographic film could be bought and processed, producing the transparencies. These would be returned to the owner of the film roll, together with the roll itself. Transparencies could then be framed at home using specialized equipment. An image – say, of a five-year-old building a sandcastle on a Normandy beach – would thus be processed into a physical good, purchased in a singular transaction in a local shop and then owned by the producer of the image – say, your mother. Some enthusiasts (like the author's father) could do the processing at home, so that the production of individual transparencies did not require any singular transactions at all: only the equipment and raw materials (such as funny-smelling chemical baths) needed to be bought.

Digital photography changed all of this, but not all at once. At least initially, only the production of the image and its processing changed. Transparencies could still be purchased from local shops and drugstores, in singular transactions. Initially, the images would however be in a digital format (say, a JPEG file) and could conceivably be transferred to the shop on a memory stick.

At a later stage, this transaction was transferred to a digital environment. Images, in a suitable digital format, could be uploaded on the website of a local shop or drugstore, and payment for further processing and perhaps delivery of the transparencies to one's home could proceed digitally. By the time of this stage, framed transparencies and home slide shows were things of the past; but, for instance, family albums with printed photographs were not. Importantly, moreover, consumers would still

---

2 Vermeir (2005).

3 Hayes (2018).

own physical goods after completion of the transaction. In terms of Table 1, a *Type-1* transaction has changed into a *Type-5* transaction at this point in the narrative.

Storing and sharing images via Google Photos or Flickr is different again from this transaction – the similarities might end in it occurring in a digital environment. Firstly, *only* digital items need to be involved. Granting access to images merely requires sending a link: no physical good, such as a transparency or printed photo, needs to be produced. Rather, the transaction involves storage of digital items (say, uploaded jpg images) in a digital environment that may also facilitate this exchange. Secondly, central to the transaction is access to sets of digital items, including the option to add and remove items and share the access with others. Further, this access is provided *as a service* by those in charge of the digital environment – acting as a provider, not as a producer in the transaction. In terms of the typology, this constitutes a *Type-8* transaction.

This means that sharing access to one's vacation photos is different from treating one's guests to a home slide show. Previously, the slide show involved the use of equipment, transparencies and other physical goods that were owned by the slide-show enthusiast, after several singular *Type-1* transactions. Now, it is as if a third party grants you unlimited access for private showings in *their* home, perhaps for a fee.

This explains why the provider may charge you or otherwise seek compensation for this form of access – one would not expect free access to a stranger's home cinema or jacuzzi, after all. It also becomes clear how over-seeing this environment can be the basis of a successful business model. In fact, this subscription model of providing access to digital content or otherwise providing services in a digital environment is one of *the* success stories of 21<sup>st</sup> century capitalism.<sup>4</sup> It forms the basis of the storage services discussed here, but is also the driving force behind Spotify, Netflix, and – outside the domain of entertainment – Windows 365.

Subscription-based transactions have been around for centuries, for instance in selling newspapers and magazines. Its recent widespread adoption, by the entertainment and software industries among others, is, in part, a response to the perceived threat posed by digitization and global access to digital environments – namely the free sharing of copyrighted materials on platforms such as Napster and the Pirate Bay. This sharing involved digital items such as mp3 or mp4 files purchased by some consumers in *Type-7* (or perhaps *Type-3*) transactions prior to sharing.

---

4 See, e.g., Johnson/Christensen/Kagermann (2008).



Anti-‘piracy’ campaigns, lawsuits and other countermeasures have been far less effective in preventing consumers from engaging in this form of sharing than the shift to flat-rate subscription-based *Type-8* transactions. Offering unlimited access to high-quality, legal copyrighted materials for a low recurring fee has, it appears, strongly disincentivized consumers from downloading files illegally.

The subscription model has, however, proliferated to all kinds of transactions. Some of these transactions involve physical goods (*Type-1* transactions substituted with *Type-6* transactions if the latter proceed online). In the Netherlands, one can buy a subscription to a “circular mattress”<sup>5</sup> or socks. Other transactions are arguably additive: firms, for instance in manufacturing industries, seek financial or strategic benefits through what has been called a shift from “manufactured goods to integrated solutions”,<sup>6</sup> “service growth”<sup>7</sup> or, perhaps most evocatively, “servitization”.<sup>8</sup> Examples include elevators and medical equipment, durable tangible goods that are typically bought together with maintenance contracts (i.e., services). Although the term ‘servitization’ suggests otherwise, the trend is largely regarded as a positive one in the management and marketing literature: the focus in the literature is on identifying ways to facilitate the process and to aid firms in developing servitization capabilities and overcoming market challenges – all to capture *extra* value and gain competitive advantage.

In combination, we see a trend towards ever more transactions that offer services – in particular, forms of access – for a subscription fee, substituting for transactions that end in transfer of ownership. Cloud-image storage is just one example of what has been called an ‘Age of Access’<sup>9</sup> and of what I will call servitization here; just as it is an example of digitization. There is, once again, no necessary connection between digitization, subscription business models, and servitization – but in practice they form an extremely powerful tandem, with clear incentives and success stories.

---

5 <https://www.auping.com/nl/news/koninklijke-auping-versnelt-circulaire-ambities-met-start-bedzzy> (in Dutch).

6 Windahl/ Andersson/Berggren/Nehler (2004).

7 Kowalkowski/Gebauer/Oliva (2017).

8 Vandermerwe/Rada (1988). This source, broadly acknowledged as coining the term in this context, shows that “servitization” as a growth strategy precedes widespread digitization. See also Baines/Lightfoot/Benedettini/Kay (2009); Zhang/Banerji (2017).

9 Rifkin (2000).

Yet, this brief discussion has looked at the phenomenon and motivations for servitization almost exclusively from the business perspective. In what follows, I examine the moral issues in these entangled phenomena, focusing on a specific case and the user perspective.

### III. *Seeking Moral and Practical Continuity*

The previous section described the trend towards servitizing transactions, shifting them from *Type-1* to *Type-8*, and it provided some background to understand and analyse this trend from a business perspective. In this section, I will turn to a moral analysis. I will argue that despite the fundamental differences between the transactions involved, there are good reasons to seek continuity with non-digitized practices, both from an ethical and from a practical perspective.

First, we should note that there is no general moral wrong-doing in servitizing transactions. Servitization might provide benefits (financial or otherwise) to producers-turned-service-providers as well as to consumers-turned-end-users, e.g., in terms of extra convenience (as for the socks) or contributing to a circular economy in one's sleep (as for the mattress). Under some conditions, servitization and other access-based schemes may be the only way to create a sufficient incentive to produce or maintain some goods (so-called 'club goods').<sup>10</sup> Cinemas and swimming pools provide cases in point.

Yet what is at stake here is not (only) offering new goods, but *changes* in the types of transactions used and associated changes in people's actions involving the goods. Digitization, as outlined above, comprises many such *substitutive* changes. Digital music services such as Apple Music and Spotify – to give one quick example – provide audio content through a *Type-8* transaction, substituting for most consumers the purchase and subsequent ownership of CDs through *Type-1* transactions. Subscription-based licensed access, however, no longer allows some forms of sharing audio content that were allowed upon purchase (i.e., borrowing one's CD to a friend). Arguably, this may disincentivize users from engaging in illegal downloading and thus preserve producers' incentives to offer the good. Yet, it *does* constrain users' actions, meaning that transaction servitization entails certain forms of interference that need moral justification.

---

10 Cornes/Sandler (1996).

Elsewhere, I have shown that these changes can be analysed through considering *bundles of rights* rather than through using monolithic and contested concepts such as “ownership”.<sup>11</sup> Here, I want to use a differentiated conception of such rights. This draws on the so-called incidents that were proposed by Hohfeld in an analysis of legal rights,<sup>12</sup> and that were also used to substantially develop moral rights.<sup>13</sup> This distinguishes, among others, *permissions* or *privileges* from *claim-rights*, and analyses moral rights as combinations of these basic incidents. Moreover, it makes these concepts relative to agents – labelled *A* and *B* – and actions.

To introduce each of these, with a simple example, consider a person’s right to write notes in a copy of *The Daughters of Cain*. The *permission* to do this is the absence of a duty to refrain from it – or, put differently, the absence of a right for others to interfere with this type of action. A *claim-right*, by contrast, means that *B* has a duty not to interfere with *A*’s action. Now suppose that *A* obtained the copy from a Little Free Library. Then, arguably, *A* does not have a duty not to write notes in it – and thus a permission to do so; still, others (e.g., the volunteer steward of the library) may seek to prevent *A* from the note-writing. In case *A* purchased the copy, however, others (e.g., the owner of the bookstore) have a duty not to interfere, i.e., *A* has a claim-right rather than a ‘mere’ permission with respect to other agents *B*. Finally, prior to purchasing the copy, *A* has a duty not to write notes in it: the owner of the bookstore has a right to interfere. Here, *A* has neither a permission nor a claim-right.

As this example makes clear, *Type-1* transactions – such as purchasing transparencies of images at a photographer’s store – traditionally come with various claim-rights, e.g., to display the transparencies; to borrow them to others; or to destroy them at will. More specifically, such rights were originally held by the producer of the goods (i.e., the transparencies, not the images) and these producer rights are traditionally exhausted after the transaction.<sup>14</sup> The production of transparencies requires handling the film roll (a tangible good) and processing the images (an intangible good). However, in the typical *Type-1* transaction involving transparencies, none of the rights over the film roll or the images are exhausted; buying transparencies at a store does not give the store owner the claim-right or even the permission to, say, display the images.

---

11 Houkes (2018).

12 Hohfeld (1917).

13 As reviewed in, e.g., Edmundson (2012); Wenar (2021).

14 This “bundles of rights” approach is developed in much greater depth in, e.g., Perzanowski/Schultz (2015).

Analysing in some detail which incidents are involved in various transactions highlights how the interests involved are balanced, and which – if any – forms of interference are warranted. Ideally, transactions are structured in such a way that legal and moral rights are protected, and economic incentives for producing and using goods and services are maintained. In practice, this is a complicated and continuous balancing act: changes in consumer needs, but also in the actions afforded by items have economic effects (say, on the commercial viability of certain goods). However, these may also trigger legal and moral disputes. Technological change also has great potential to disturb any previous balance, especially if it is a non-incremental change.

In some cases, digitization triggers a need for fine-tuning or adjusting an existing balance because of the increased potential for actions. One example is the use of digitally manipulated images of deceased celebrities for commercial purposes, which triggers fine-tuning of the right of publicity to safeguard the interests of heirs, fans and the general public.<sup>15</sup> In other cases, the changes wrought by digitization are too large and trigger a need to *recreate* the balance. This, I submit, is true for servitization: the shift from *Type-1* transactions, with singular purchases of physical goods in offline environments, to *Type-8* transactions, which are subscription-based and service-oriented, is too large to address through fine-tuning of one or two claim-rights.<sup>16</sup>

The comprehensive assessment required to recreate a balance from scratch may well be unfeasible, given the many interests and contextual details at stake. Even the simple purchase of a paperback novel, as in the example above, involves a bewildering variety of claim-rights and permissions with respect to multiple agents. For this very reason, a sensible approach for the moral component of this task – applicable before any further fine-tuning or more comprehensive assessment – is to *seek as much continuity as possible* on the level of permissions and claim-rights. If agents had permissions or claim-rights regarding certain actions after some transactions, then they had no duties to refrain from these actions and others might have duties not to interfere. If any known transaction is then substituted by another transaction, the very same permissions and claim-rights may pertain, unless there is some compelling reason why there are now

---

15 Petty/D’Rozario (2009).

16 The size of the difference is described by others as “a bifurcated universe” (Perzanowski/Schultz (2005)) or “worlds apart” (Wendehorst (2016)). Although this might overstate the case (Houkes 2018), it indicates the difficulties experienced in addressing the shift.

duties to refrain from actions or interference. On this basis, one may argue that purchasing access to digital content should, just as purchasing paperback novels, come with a right to share them with persons of one's own choice.<sup>17</sup> Conversely, any *new* opportunities for action that arise for some parties in the new transaction need to be justified before they ground new permissions or claim-rights. Thus, Apple should arguably not have presented all iTunes subscribers with U2's album *Songs of Innocence* without their (the subscribers) explicit consent. That the subscription-based transaction gave Apple this opportunity did not automatically give them permission to do so.<sup>18</sup>

This 'continuity heuristic' is rich in assumptions: from an economic perspective, it assumes substitutivity; and from a moral perspective, it assumes prior permissions and claim-rights without identifying any morally relevant interests at stake. Still, before turning to problems of implementing the heuristic, there are reasons to think that continuity will be sought also from a practical perspective, and this provides indirect support for seeking moral continuity.

The practical reasons for continuities concern the design and usability of the items involved in the transaction. Following Norman's seminal work on user-centred design,<sup>19</sup> it is widely considered a precondition for adoption and usability that there is a match between its features and the mental models of its prospective users – where the model is a representation of a good's features and of the actions that may be taken with it. Mental models, in turn, are based to some extent on perceptible features of the item (called 'use cues' by Norman), but to a far larger extent on previous experience with successful use with items in the same broad functional category. To give a simple household example: it is possible to design a toaster with features and affordances that have little in common with those of toasters familiar to users, but this will seriously impede usability, adoption and thus ultimately commercial success of even 'technologically' superior toasters. This insight holds true for digital items as well as for physical ones and for physical items that become digitized. In all cases, continuities in functionalities and user interfaces increase adoption and usability, and strong discontinuities are a major cause of market failure.

---

17 Houkes (2018).

18 <https://appleinsider.com/articles/18/09/09/the-free-u2-album-songs-of-innocence-w-as-a-debacle-for-apple-fans-on-september-9-2018>.

19 Norman (1988).

There is already some research on the mental models of cloud-based image storage. One recent study<sup>20</sup> focuses on the generational differences in perceptions, to identify ways to improve usability and overcome adoption barriers for older users. It finds that mental models of older users vary considerably and often poorly reflect the actual functionalities and affordances of photo storage services. It concludes that more should be done to make digital photo tools resemble physical photo albums, an approach that is sometimes labelled “familiarity design”.<sup>21</sup>

This and other studies into mental models show that, from a usability or commercial perspective, it is best to maximize mental-model or cognitive continuities. Such continuities would carry over into the legal realm because they create *reasonable expectations*<sup>22</sup> regarding what may and may not be done with the items based on the transactions. Finally, the desirability of mental-model continuity from a commercial and usability perspective and consequent legal continuity aligns with the earlier plea for *moral* continuity, i.e., preserving the existing balance of rights between parties. Traditional *Type-1* transactions then serve as a benchmark for digitized, servitized transactions: tradition exerts a cognitive, commercial, legal, and moral pull.

Yet can such continuity be achieved, given the fundamental differences between physical goods and their digitized mentioned above, regarding subscription-based, service-oriented counterparts? Granting users the exact same rights over their images in *Type-8* transactions as they had in *Type-1* transactions may well upset any prior balance. After all, business models adapted because of digitization: it may just not be commercially viable to offer users all their traditional rights without some extra compensation for the producer-turned-provider. Furthermore, it may be difficult to specify the rights for which continuity is sought. Claim-rights and permissions concern actions that may be taken with the item, based on the transaction, e.g., “to look at one’s stored images at will” or “to share images with people of one’s choice”. Yet many actions associated with physical photos or albums – such as “to tear up all photos showing one’s partner after a break-up” – are simply impossible. Digital ‘counterparts’ of such actions can be imagined, but these are strictly speaking not identical; and calling them ‘counterparts’ or ‘equivalents’ risks begging the question. Conversely, digital environments afford many actions – such as “to remove red-eye

---

20 Axtell/Munteanu (2019).

21 E.g., Zhang/Banerji et al. (2016).

22 See, e.g., Helberger (2011); Helberger/Loos/Guibault/Mak/Pessers (2013).

effects in images with a few mouse-clicks” – that were, again strictly speaking, previously impossible. Furthermore, following a basic insight from philosophical action theory, any action can be described at multiple levels. Actions that are equivalent under one description may be very different under others: “to look at pictures” is a high-level description of sequences of radically different actions in a physical and digital environment. Even for cloud-based image storage itself, research has shown that users typically have very different mental models of the constitutive actions in relatively basic processes for cloud-based storage, such as “uploading and viewing pictures”.<sup>23</sup>

This suggests that complete continuity does not make sense as a practical or moral aspiration. The discontinuity is so obvious, and a new balance so much still in the making, that protecting user rights in servitized transactions should be mostly a matter of due diligence on the part of those users. After all, even if digital photo storage is organized in ‘photo albums’ placed on a ‘shelf’, users should know – among many other things – that they have not purchased pictures or an album that they own and may dispose of as they wish; that they may lose access to their albums once they stop paying the subscription fee; and, in case they are not paying a monetary fee, that you are paying with personal data.

This response overshoots its mark in ignoring both that producers and service providers have a responsibility to respect basic consumer rights and – more importantly – that many digital services are presented in such a way that they resemble familiar transactions. As much as this improves usability and lowers adoption barriers, benefiting the provider, it *also* creates reasonable expectations about the rights involved and the transaction. Making maximal use of familiarity design to create ‘cosmetic’ similarities, deliberately highlighting superficial continuities, while capturing maximal value from the underlying discontinuities, is a slippery slope to manipulating and deceiving users into commercially desirable behaviour.

The right conclusion to draw is therefore that, wherever continuity is highlighted, in presentation or description, expectations are also created about permissions and claim-rights. These expectations need to be actively corrected or endorsed by whoever highlighted the continuity. Conversely, any discontinuities that might be reasonably overlooked by users should be deliberately highlighted (in a more accessible form than in most terms of service). Here, entirely new action potentials on the part of service

---

23 Axtell/Munteanu (2019) Section 4.

providers (e.g., inspecting images purely for their own benefit) should be made explicit or not result in any new claim-rights or permissions.

Continuity might only be found in relatively coarse-grained descriptions of actions (e.g., “to organize images” or “to edit images”), but such descriptions are also typically found in user interfaces, users’ mental models and, importantly, in specifications of legal rights. These all refer to actions such as “to display” or “to share” rather than “to upload a jpg to a server” or “to project a transparency for Uncle Kees’s entertainment”. Counterparts of such actions involved in servitized goods and transactions are the loci of reasonable user expectations and should be accepted as such by providers or – alternatively – very explicitly dismissed.<sup>24</sup> According to the continuity heuristic, providers should either accept the adoption barriers resulting from the latter or the loss of captured rights and value resulting from the former.

#### *IV. Moral Constraints on Cloud-Based Image Storage*

In this section, I identify several provisional constraints concerning cloud-based image storage, the transactions involved, and the information provided. These constraints are considered for both the users and the providers of these digital services. In line with the results of III., most constraints concern reasonable expectations regarding claim-rights and permissions. These are organized by four high-level actions that have been distinguished – under slightly varying headings – in the literature on the use of photo cloud storage, especially in studies that compare it to or otherwise discuss it in continuity with the use of traditional photo albums.<sup>25</sup>

For these actions, I focus on rights and permissions that would be equivalent to those associated with traditional photo albums – in line with the continuity approach outlined in the previous section. Moreover,

---

24 This aligns with a statement by Maciej Szpunar, advocate general to the Court of Justice of the European Union, regarding the lending of e-books by public libraries: if lending e-books is arranged in a similar way as lending physical books, some coarse-grained action descriptions such as “to share” or “to borrow” still apply. Consequently, the existing exception for public lending as its “modern equivalent” may be applied; see Advocate General’s Opinion in Case C-174/15 – *Vereniging Openbare Bibliotheken v Stichting Leenrecht*, 16 June 2016, <https://curia.europa.eu/jcms/upload/docs/application/pdf/2016-06/cp160064en.pdf>.

25 E.g., Keightley/Pickering (2014); Broekhuijsen/van den Hoven/Markopoulos (2017); Axtell/Munteanu (2019).



I highlight those that are mostly closely connected to the exercise of individual autonomy. This reflects what some have identified as the primary function of rights, namely, to serve the interest of right holders in exercising autonomous choice.<sup>26</sup> Photo albums and their digital equivalents are not merely repositories of information, although they may also serve as such. They are also instruments of identity or what some have called ‘technologies of memory’.<sup>27</sup> This is the same for traditional photo albums<sup>28</sup> as well as for digital ones;<sup>29</sup> these continuities persist despite any differences.<sup>30</sup> Images, either tangible or digital, serve as memory cues,<sup>31</sup> and organizing and displaying images supports the formation and maintenance of narrative identity, both individual and collective (e.g., as a family or group of friends). Interference with actions that involve (self- or collective) identity formation and expression thereof does more than merely upset some vested interests that came with a now outdated technology. Thus, the constraints discussed in this section do more than assume that there were claim-rights and permissions associated with physical photo albums: they are based on reasons that there should (or should not) have been such claim-rights and permissions – and that the same should apply after digitization. In this section, it is assumed that the transactions involved in cloud-based image storage are substitutive for those involved in physical photo albums. I will return to this assumption in the concluding section.

### 1. *Accumulating*

Accumulating images includes creating them and uploading or transferring them into cloud storage. Not all the images in one’s storage may be one’s own creation; most people also store images that were created by others, such as their family and friends.

As an activity, this creates an aggregate or repository of images without any narrative structure. Still, these images serve as memory cues or, more broadly, resources for identity formation and self-expression. As such, it is important to have a large measure of control over which images may and may not be stored. This leads to two constraints.

---

26 Edmundson (2012) Chapter 7.

27 Van House/Churchill (2008).

28 Hirsch (1997).

29 Van Dijck (2008).

30 Frohlich/Kuchinsky/Pering/Don/Ariss (2002); Keightley/Pickering (2014).

31 Broekhuijsen/van den Hoven/Markopoulos (2017).

One is that accumulating personal images is best done deliberately. Many cloud storage services offer automatic uploading options or ‘passive storage’, by which any image created by a user is stored by default. Furthermore, the ubiquity of smartphones has radically increased our opportunities for creating images, and people’s individual photo collections have grown from hundreds to often tens of thousands<sup>32</sup> – many of which are automatically uploaded. Consequently, many users are surprised by the sheer number of images in their storage, many of which they did not even remember creating.<sup>33</sup> For the purpose of identity formation, unintentional accumulation creates a need for more extensive curation and deletion.<sup>34</sup> Otherwise, it may lead to ‘mnemonic noise’ that only interferes with processes of reminiscence and storytelling rather than facilitating it. This is not only a privacy concern that leads to constraints on provider’s terms of service, but it should give users pause in opting for comfort or completeness at the price of undermining the value of their collection as a technology of memory. This may be expressed in terms of duties that users have to themselves or, alternatively, in terms of a lack of permission on the provider’s part to activate automatic uploading without the user’s consent.

A second constraint more exclusively targets the service provider. There are recurring concerns that people use cloud storage services to collect (and share) materials that they did not create themselves and over which they consequently do not have authorship rights.<sup>35</sup> Providers vary in their policies regarding such copyright infringements. Currently, most only respond to complaints by copyright-holders, but conceivably content could be actively monitored, and any content to which the user has no legal rights could be removed (or fail to upload in the first place). Such policies would interfere with private use of copyrighted materials that, in some cases, may be owned by those who uploaded the images and, in other cases, freely shared by their creators with those who stored them. Interfering with such practices would not have been acceptable (or possible) for traditional photography, and increased possibilities for monitoring and

---

32 Broekhuijsen/van den Hoven/Markopoulos (2017).

33 Clark/Snyder/McCoy/Kanich (2015).

34 See below, IV. 3 and 4.

35 A more trivial constraint is that users retain any authorship rights that they have over the images; storage should not come with transfer of intellectual property rights.

checking cloud-stored images or applying upload filters do not make it any more acceptable (or necessary for the case of personal use).<sup>36</sup>

## 2. Accessing

This activity involves all kinds of access to the images for its owner/creator and others. It includes viewing them, navigating through collections, and sharing them with others – either deliberately or not. Displaying in a digital environment is partly equivalent to browsing through a physical photo album or attending a slide show, but without the narrative element, which will be discussed below under ‘curating’. Facilitating various kinds of display has been called the ‘database’ or ‘storage’ functionality.<sup>37</sup>

A first access-related constraint, echoing well-rehearsed privacy concerns, is that a user should have full control over who has access to which images. Sharing images fosters social connections and prevents social isolation, as has been found in various studies.<sup>38</sup> Many users share images mainly with friends and family, and express worries about unauthorized access, or accidentally giving someone access to too many materials. Service providers should therefore impose no restrictions on whom a user wants to give access, but without making full access the default option. Furthermore, sharing access rights with others should not automatically give them a license to use these images for their own purposes – just as showing others your physical photo albums does not give them the rights to change them or take pictures of them. Some providers offer users the option to specify the license for each stored image, such as ‘All rights reserved’ or ‘Public Domain Dedication (CC0)’.

Second, access by the service provider should be kept to the minimum needed to operate the service or any additional value captured through access should be made fully explicit to the users. It is now sufficiently well known that the business models of many providers allow access in order to personalize advertisements, or otherwise collect data on users. Users

---

36 For the new European legislative framework see Article 17 of Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (OJEU L 130 of 17 May 2019, 92), defining the legal duties of online content-sharing service providers vis-à-vis rightholders and its users.

37 E.g., Axtell/Manteanu (2019).

38 See earlier references.

should not need to read the terms of service to find out, but the contrast with access to traditional photo albums is so stark that close monitoring of business practices or even more explicit warnings to users – rather than relatively neutral descriptions of ‘legitimate uses’ by providers – are called for.

Thirdly, and perhaps most contentiously, users should not become too dependent on particular service providers for access to their stored images. Servitization is attractive from a business perspective because it enables capturing value over a longer time, and disincentivizing transactions with business rivals. Adding ever more services for customers, at relatively low subscription fees (or partly/initially free of charge), is a very powerful growth engine for big tech companies, also because many such services show high ‘customer loyalty’. This loyalty – more appropriately called ‘retention’ – may be fostered through positive incentives, such as making the service attractive and easy to use, but also by making it difficult for users to transfer their stored content or to retain access after cancelling their subscription. This is the same for services with database functionalities, and more strongly for those that allow elaborate curation (see below, IV.3). What users stand to lose is not just the time invested, but also the resulting narrative. To put it dramatically, if one’s personal or family history is documented through photo cloud storage, this aspect of one’s identity is being made hostage to payment of a subscription fee, as well as continued existence of the service provider, including file formats etc. It is worth studying how incentives for cancelling subscriptions or transferring to another service provider are best safeguarded, e.g., by stimulating or requiring interoperability of storage services. This would serve to protect the rights of users over these technologies of memory, as well as to prevent virtual monopolies over communities of users.

### 3. *Curation*

Curating images comprises several activities, all aimed at preserving, organizing, editing, tagging and sorting the content of one’s photo storage, deciding what to keep, and in which structures and formats. Arranging printed pictures in a photo album or preparing a slide show of one’s transparencies were traditional forms of this activity. The number of images produced and stored nowadays produces a far greater need for curation, to prevent databases filled with “faceless stuff”.<sup>39</sup> In line with this, when

---

39 Van House/Churchill (2008).

comparing digital storage to physical photo collections, users report that curation activities have become more important in digital storage to create and preserve a valuable collection of images, and that these activities have become more demanding and time-consuming. This goes for providing an explicit narrative structure (e.g., by organizing images and writing captions), but also for more rudimentary forms of curating, such as tagging images with metadata or simply organizing them in sub-collections.

This creates opportunities for providers to make their photo-storage services more attractive to users, viz., by making curation easier or less strenuous. Usability studies have identified both the need and opportunities for storage services to enhance their narrative functionality,<sup>40</sup> and many providers have indeed done so. However, these opportunities come with constraints.

One constraint are features of cloud-based storage services that allow users to curate digital images much like they would curate physical photo albums. This familiarity design would on the one hand greatly improve usability, especially for older users who have experience with physical albums. On the other hand, this approach would be susceptible to the argument presented in section III. that users may reasonably expect to have the same rights and permissions over the resulting digital albums as they did over the physical albums – or it should be made very clear to them that they do not, on pain of lowering adoption barriers through manipulative presentation of the service.

Another, perhaps obvious constraint is on the access to curated collections. Such collections have a better claim on being technologies of memory and identity formation than mere image databases, and therefore giving users full control over who can and cannot access curated collections is even more important. Options to customize sharing settings on social media such as Facebook – in response to demands for more transparency to and control for users – are a case in point.

Thirdly, providers might offer (automated) suggestions that support or partly replace curating activities by users. Examples are suggested collections of ‘related’ pictures or automated tagging. As useful and attractive as these might be, they require more extensive access to and processing of images than users would – or should – want. For one thing, these suggestions indicate the activity of pattern-recognition algorithms or other forms of data mining. In particular, images in cloud storage are likely to contain

---

40 E.g., Keightley/Pickering (2014); Broekhuijsen/van den Hoven/Markopoulos (2017).

many faces of the same or closely related people, with a multitude of expressions. This makes such collections invaluable resources for developing facial-recognition technologies – which providers often describe at best indirectly and abstractly in the terms of service (e.g., as “our products”). The ethical problems of such technologies cannot be spelled out here,<sup>41</sup> but are substantial. This means that users should at least be made aware of this usage of their collections, so that they can consider these potentially negative side-effects of a slight reduction of their workload in curating.

Another aspect of automated curation is that there is value in performing curating activities.<sup>42</sup> Organizing pictures and writing captions are themselves techniques of storytelling, which trigger memories, and facilitate reflection on one’s identity. Users need to consider carefully whether the ease of (partly) outsourcing such activities outweighs the value of engaging in them. This may not lead to rejecting the outsourcing: given the workload involved in curating, some automated assistance might be needed to engage in these activities in the first place.

Finally, on a related note, automated curation may reduce options for tailor-made curated collections. Identity and personal narratives are to some extent specific to social situations and interactions: one does not show the same ‘face’ to one’s grandmother and one’s colleagues, for instance. Users of photo services would indeed prefer (in principle) to express themselves differently to different social relations, and this contributes substantially to the workload. Automation may again reduce this, but at the price of either giving an even richer source of resources for alternative applications (i.e., pattern recognition algorithms could also be trained for images associated with particular social situations) or sharing only marginally different versions of oneself with different social relations (in case the options for automated fine-tuning are limited).

#### 4. *Deleting*

A final set of activities is the removal of images, curated or not. Users tend to overlook these activities in their mental models of cloud photo storage,<sup>43</sup> although when prompted, they identify the risks that come with inadequate or incomplete opportunities to delete images.

---

41 See, e.g., Selinger/Leong (2021) for a thorough review.

42 E.g., Stevens/Abowd/Truong/Vollmer (2003).

43 Axtell/Munteanu (2019).

Constraints on these activities are closely associated with those on accumulating or accessing. As said above, there may be too much accumulation from the user's perspective because of automatic uploading from various devices or apps. If accumulating is not constrained directly, users should have ample options to delete images: they have claim-rights on doing so. Furthermore, deleting trivially leads to lack of access, but the latter should not be mistaken for the former. Although losing or accidentally deleting images is mentioned by many users as the primary risk of storage services, they also express scepticism about the completeness of deletion.<sup>44</sup> The difficulties people encounter in making sure that their images can no longer be accessed by anyone, are well-documented. But where this may concern proliferation of images over websites and repositories, 'deleted' is also a flexible notion when it comes to single files. Many apps contain paradoxically named 'Deleted items' folders, and even items that have been 'permanently deleted' from such folders can still be retrieved with some effort by many users. Mistrust whether service providers have 'permanently' deleted items once they can no longer be accessed by the user therefore seem well-grounded. And providers should do more to ensure deletion and assure users of it: making it difficult for users to verify whether images have been deleted constitutes interference with an action to which they are entitled. In the past, one would have been outraged if a photographer had retained images that she had processed for her clients, and worried if it were unclear whether she had retained the images. Here, the argument of section III. applies in full force: users have a right to have their images be deleted without a trace from storage services.

## V. *Conclusions*

In this chapter, I have discussed cloud-based image storage from a moral perspective. After proposing a continuity heuristic for moral assessment and discussing some conceptual difficulties in its implementation, I derived a set of provisional moral constraints on cloud-based image storage, associated with the function of collections of personal images to support the formation and reflection of individual and collective identity.

This discussion does little more than scratch the surface. More systematic and specific analyses are needed to spell out the claim-rights and permissions that users and providers should and should not have. Some,

---

44 Keightley/Pickering (2014).

but not all of the constraints in section IV. have been explicitly formulated in these terms. This also shows that more may be at stake than these Hohfeldian incidents: I have used a partial analysis at best to analyse basic rights in servitized transactions, which can and should be supplemented in many respects. Furthermore, moral constraints have been identified based on cloud-based services being ‘technologies of memory’ that substitute for physical photo albums. This ignores the many other functions – new or old – that such services might have for users. Such functions may give rise to constraints of their own.

Despite these limitations, I hope to have shown that there are genuine moral issues to be resolved concerning cloud-based image storage, and illustrated, at the very least, one way to address these issues. Furthermore, and more importantly, I hope to have conveyed some of the urgency of engaging with these issues – not only because of the growing importance of cloud-based services in maintaining collections of personal images, but also because the servitization and digitization of this aspect of our lives is only one instance of an ever more encompassing trend.

## References

- Axtell, Benett/Munteanu, Cosmin (2019): ‘Back to real pictures – A cross-generational understanding of users’ mental models of photo cloud storage’, *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 3, Article 74 (2019, available at <https://dl.acm.org/doi/10.1145/3351232>)
- Baines, Tim S./Lightfoot, Howard W./Benedettini, Ornella/Kay, John M. (2009): ‘The servitization of manufacturing – A review of literature and reflection on future challenges’, *Journal of Manufacturing Technology Management* (2009) 547–567
- Broekhuijsen, Mendel/van den Hoven, Elise/Markopoulos, Panos (2017): ‘From PhotoWork to PhotoUse – Exploring personal digital photo activities’, *Behavior & Information Technology* (2017) 754–767
- Clark, Jason W./Snyder, Peter/McCoy, Damon/Kanich, Chris (2015): “I saw images I didn’t even know I had” – Understanding user perceptions of cloud storage privacy’, *CHI’15: Proceedings of the 33<sup>rd</sup> Annual ACM Conference on Human Factors in Computing Systems* (2015; <https://doi.org/10.1145/2702123.2702535>) 1641–1644
- Cornes, Richard/Sandler, Todd (1996): *The Theory of Externalities – Public Goods and Club Goods* (Cambridge: Cambridge University Press 1996)
- Edmundson, William A. (2012): *An Introduction to Rights* (Cambridge: Cambridge University Press 2<sup>nd</sup> edition 2012)



- Frohlich, David M./Kuchinsky, Allan/Pering, Celine/Don, Abbe/Ariss, Steven (2002): 'Requirements for Photoware', Proceedings of the 2002 ACM Conference on Computer-Supported Cooperative Work (New York: ACM Press) 166–175
- Hayes, Emily (2018): 'Geographical light – the magic lantern, the reform of the Royal Geographical Society and the professionalization of geography c. 1885–1894', *Journal of Historical Geography* (2018) 24–36
- Helberger, Natali (2011): 'Standardizing consumer expectations in digital content', *Info* (2011) 69–79
- Helberger, Natali/Loos, Marco B.M./Guibault, Lucie/Mak, Chantal/Pessers, Lodewijk (2013): 'Digital content contracts for consumers', *Journal of Consumer Policy* (2013) 37–57
- Hirsch, Marianne (1997): *Family Frames – Photography, Narrative and Postmemory* (Cambridge, MA: Harvard University Press 1997)
- Hohfeld, Wesley N. (1917): 'Fundamental Legal Conceptions as Applied in Judicial Reasoning', *The Yale Law Journal* (1917) 710–770
- Houkes, Wybo (2018): 'Licensed to share?' in: Joerden, Jan.C./Schmücker, Reinold/Ortland, Eberhard (eds), *Jahrbuch für Recht und Ethik* (2018) 209–223
- Johnson, Mark W./Christensen, Clayton M./Kagermann, Henning (2008): 'Reinventing your business model', *Harvard Business Review* (2008) 58–67
- Keightley, Emily/Pickering, Michael (2014): 'Technologies of memory: Practices of remembering in analogue and digital photography', *new media & society* (2014) 576–593
- Kowalkowski, Christian/Gebauer, Heiko/Oliva, Rogelio (2017): 'Service growth in product firms – Past, present and future', *Industrial Marketing Management* (2017) 82–88
- Norman, Donald A. (1988): *The Design of Everyday Things* (New York: Basic Books 1988; original title: *The Psychology of Everyday Things*)
- Perzanowski, Aaron K/Schultz, Jason (2015): 'Digital exhaustion', *UCLA Law Review* (2015) 889–946
- Petty, Ross/D'Rozario, Denver (2009): 'The use of dead celebrities in advertising and marketing: Balancing interests in the right of publicity', *Journal of Advertising* (2009) 37–49
- Rifkin, Jeremy (2000): *The Age of Access* (New York: Tarcher/Putnam 2000)
- Selinger, Evan/Leong, Brenda (2021): 'The ethics of facial recognition technology' in: Véliz, Carissa (ed): *The Oxford Handbook of Digital Ethics* (Oxford: Oxford University Press, 2021, <http://dx.doi.org/10.2139/ssrn.3762185>)
- Stevens, Molly M./Abowd, Gregory D./Truong, Khai N./Vollmer, Florian (2003): 'Getting into the living memory box: Family archives & holistic design', *Personal and Ubiquitous Computing* 7 (2003) 210–216
- van Dijck, José (2008): 'Digital photography: Communication, identity, memory', *Visual Communication* 7 (2008) 57–76

- Van House, Nancy A./Churchill, Elizabeth F. (2008): 'Technologies of memory: Key issues and critical perspectives', *Memory Studies* 1 (2008) 295–310
- Vermeir, Koen (2005): 'The Magic of the Magic Lantern (1660–1700): On analogical demonstration and the visualization of the invisible', *The British Journal for the History of Science* (2005) 127–159
- Wenar, Leif (2021): 'Rights', in: Zalta, Edward N. (ed): *The Stanford Encyclopedia of Philosophy* (Spring 2021 edition, <https://plato.stanford.edu/archives/spr2021/entries/rights/>)
- Wendehorst, Christiane (2016): *Sale of Goods and Supply of Digital Content – Two Worlds Apart?* European Parliament, Directorate General for Internal Policies, Policy Department C In-Depth Analysis PE 556.928 (2016, [https://www.europarl.europa.eu/cmsdata/98774/pe%20556%20928%20EN\\_final.pdf](https://www.europarl.europa.eu/cmsdata/98774/pe%20556%20928%20EN_final.pdf))
- Windahl, Charlotta/Andersson, Pierre/Berggren, Christian/Nehler, Camilla (2004): 'Manufacturing firms and integrated solutions: Characteristics and implications', *European Journal of Innovation Management* 7 (2004) 218–228
- Zhang, Wanrong/Banerji, Sujit (2017): 'Challenges of servitization – A systematic literature review', *Industrial Marketing Management* (2017) 217–227