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Florent Thouvenin · Peter Hettich
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Remembering and Forgetting in the Digital Age

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Herbert Burkert • Urs Gasser

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And with Individual Contributions from
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Mark Schelker, Christine Benesch, Matthias Klemm,
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Preface

The following volume is the result of an interdisciplinary research project that has been carried out jointly by the Research Center for Information Law (FIR-HSG) at the University of St. Gallen, the Berkman Klein Center for Internet and Society at Harvard University, and the Center for Information Technology, Society, and Law (ITSL) at the University of Zurich. This extraordinary endeavor, culminating in the present volume, was made possible by a grant from the Swiss National Science Foundation. We graciously acknowledge their support.

The project underlying this volume consisted essentially of four stages. First, two doctoral students carried out a comprehensive analysis of the Swiss legal system. This analysis permitted the identification of the regulatory concepts that are currently applied in regulating remembering and forgetting. Second, these normative concepts were presented at an initial international and interdisciplinary workshop that brought together researchers from different fields such as computer science, mathematics, psychology, philosophy, history, sociology, anthropology, communications, economics, ethics, and law. At this workshop, we primarily discussed individual and collective functions and mechanisms of remembering and forgetting. In addition, we sought to analyze the impact of information technology on individual and collective memory and the respective changes that have emerged in society. Third, the very rich and diverse insights from the workshop were assessed by the research team. At a later stage, and with these insights in mind, each member of the research team drafted an individual analytical paper in which he or she proposed possible reactions from the legal system to the challenges identified at the first workshop. Fourth, some of the preliminary findings that had been proposed in the analytical papers served as a starting point for a second interdisciplinary workshop that—again—brought together researchers from diverse fields. At this second workshop, we chiefly focused on the question of what policy-makers must take into account when regulating remembering and forgetting. In addition, we strove to identify the most important pressure points, i.e., the areas where an intervention by the legislature is most needed. Last but not least, we discussed which intervention mechanisms were available with respect to each of the normative concepts that had been identified and

if additional mechanisms might be needed. The ultimate goal of the research project was to create a design guide that would provide guidelines on how to best handle remembering and forgetting of (personally identifiable) information in a legal framework. On the basis of our analyses and insights gained from the two workshops, an initial version of a design guide was presented in the online journal *Information Research*. The final version appears here as the conclusion to this volume.

Numerous individuals contributed to the development and realization of this volume, including the attendees of the two expert workshops mentioned above. In addition to the interdisciplinary perspectives, the following authors contributed to the production of this volume: The Introduction was provided by Urs Gasser and Herbert Burkert. The chapter concerning legal framework was penned by Florent Thouvenin, Patrick Eggimann, and Rehana Harasgama. Florent Thouvenin, Peter Hettich, Barbara Kaiser, Nicole Ritter, Katharina Dyck, and Nicola Orlando provided the chapter on technological developments, with the part on mobile internet drawing from Rolf Auf der Mauer and Thomas Steiner's insightful groundwork. The design guide is a collaborative production between Florent Thouvenin, Herbert Burkert, Peter Hettich, and Rehana Harasgama. In addition to acting as copy editor for the entire volume, James M. Thurman also provided substantial contributions to the chapters on technological developments and legal lramework. Damian George acted as copy editor and produced the introduction to the interdisciplinary perspectives.

All contributors have our heartfelt gratitude for their efforts in making this publication possible. Unless indicated otherwise, literature and case law were considered until end of 2016.

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Part I
Introduction

1 Overview, Purpose, and Scope

In today's networked information society, more and more information is being produced and consumed in digital form. Much of this information is readily available, able to be called up at any moment on devices we carry in our pockets, and perhaps more so in future, wear on our wrists or on the bridges of our noses—perhaps 1 day even embedded in our bodies. The storage of such digital information has become easier and cheaper, transitioning from large reels of magnetic tape that were relegated to isolated large-scale computing centers, to memory sticks or SIM cards and now even the nebulous "cloud", seemingly accessible at all times and from virtually any location. Yet, despite the fact that a blog entry from 7 years ago can generally still be viewed today without many of the issues or risks of loss that plague paper documents, digital information within constantly operating networks is deceptively vulnerable; continuous curation is required to preserve its on-going availability. These aspects of the networked, digital data ecosphere which we currently inhabit have produced a shift in the previously prevailing balance between remembering and forgetting.

This shift precipitated a debate within the information law community: first, concerning the concept of a "right to be forgotten" with regard to personal data retrieved by search engines and the extent to which such a right should become an explicit element of data protection law. In the midst of this debate, Viktor Mayer-Schoenberger's book *delete* appeared, providing an eloquent contribution to the discussion and an appeal for a technical implementation of such a right. Then came the decision of the European Court of Justice which effectively confirmed the existence of such a right, flowing from the then prevailing framework of European data protection law. On the heels of this decision followed the recent enactment of the General Data Protection Regulation by the EU Parliament, which explicitly acknowledged and expanded upon this right.

For quite some time before this debate remembering and forgetting in individuals had been a subject of interest for medical science and physiology which profited

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from new insights provided by brain research and its use of technological advances in representation technology.

In yet another context memory was receiving increased attention as a social and indeed political phenomenon in an era of political system change: The end of the Soviet Union and its repercussions in neighboring states including its effects on German reunification, changes in South Africa, and before that the end of dictatorial regimes in Chile and Argentina had led to reflection processes on what to remember and what to forget about national historical experiences. In Asia, Indonesia and Cambodia had been going through a similar process. For the relations between Japan and South Korea and China remembering and forgetting are still present issues affecting their relations to this day. The politics of memory—as these examples show—play an important role in a country's identity and the way it is viewed in the world community.

In a less dramatic way the politics of memory—how the political system deals with individual and collective memory—are an integral part of policy making ranging from deciding on what should be regarded and protected as national treasures to decisions on educational curricula and their implementation. Such policies are seen to contribute to preserving national culture and enabling it to adapt to the challenges of change and maintaining social cohesion, particularly where nationhood is still comparatively young or where a nation already comprises diverse cultures and languages.

Not only the individual memory functions and the memories of nations have received increasing attention. Also private and public organizations are facing challenges to memorize. Not only have they often been involved in those crises of national memories as participants in a questioned historical past, but also the requirements of the modern information state have created an increasing amount of recording duties and information preservation obligations keeping records accessible for a variety of reasons ranging from financial accountability, client and consumer protection, to social responsibilities.

The reference to such informational duties is a reference to the second element in the triangle of relationships: law and its role in relation to national and organizational but also individual processes of remembering and forgetting. Legal regulations from laws to decrees down to administrative interpretations accompany the life cycle of information in private and public organizations, defining when and where and how and for how long which information has to be preserved, guarded, retrieved, kept accessible, or irrevocably deleted. Individuals, too, have to accept an increasing legal burden of keeping records of their biographies and interactions as consumers or citizens to obtain or retain entitlements. Facing the memory of nations, as described above, has contributed to the development of international humanitarian law. Procedures and institutions for facing a nation's past needed to be implemented by law with countries in similar situations borrowing such models from each other. It is law that plays an essential role in what has to be remembered and how memory has to be retrieved and what may be forgotten.

Whatever law prescribes it has to take into account how individuals, organizations and the state are remembering, which tools they use, what material carriers they

use for their recordings and the changes in those technologies of memory. It is this third element—technology—more precisely information technology that has brought new dynamics to the interrelations between memory and law. It should be noted that it has been the legal system itself that from early on experienced the challenges of technological change for its own institutional memory: Digitalizing court records and decisions, and making them available to an ever increasing audience were among the first applications for automated information processing that in turn led to political, social and economic questions such as for example the impact of the general accessibility of legal information on the control of judiciary output and juridical independence.

The technology of memory had largely been restricted to various manners of keeping and organizing fixations of writing. Voice recording or more generally signal recording had then added another dimension allowing for new workflow organization in offices as well as providing new ways for re-creation. But those new carriers of memory had still to be organized and retrieved very much like written documentation requiring spatial arrangements and cataloguing for retrieval. The essential change started when such signal recordings became linked to computational devices that were in need of working storage (the random access memory in technical terms) and of more comprehensive output fixations beyond the screen display and the print-out. Memory technology serving computation processes quickly re-emancipated itself when computation expanded to other media making them digestible by digitalization. Digitalization, storage technology and retrieval techniques then continued to further develop in their own right following the patterns of innovation: what had been big became smaller, what had been fixed became moveable, what had been simple became more complex, what had been designed for a single purpose became multi-purpose, what had been slow became faster, what had been swallowing resources became more economical, what had been expensive became cheaper. Technological developments like those in storage technology led authors like Mayer-Schoenberger to the conclusion that extensive recording and keeping what had been recorded and eventually making retrievable what had been kept was becoming a social normality whereas the burdens of traditional recording, their material fragility and eventual perishing had become a thing of the past leading to what has been called the default switch from forgetting to remembering.

Do these technological developments indeed require a new look at the interrelation between memory and law? Or rather before asking that question, is this default change a correct perception of technological change, or is this change more complex bringing with it its own mitigating technical limitations and social corrective measures? What are then the consequences for law from these insights? To what extent should law (and other social steering mechanisms) be adapted or innovated to meet challenges from whatever changes that have been observed?

To address these and related questions, this publication combines three aspects: law, technology, and interdisciplinary perspectives that bring together a variety of authors who survey various areas of the interplay between memory, technology and social intervention from their own unique disciplinary perspective. Mirroring the multi-faceted and highly dynamic character of remembering and forgetting, these

interdisciplinary contributions are less an attempt aimed at systematically or comprehensively analyzing as opposed to triangulating the phenomenon. In this process of multi-perspectival triangulation, however, a series of key discussion threads have emerged, which are outlined further below. These threads are in part reflected in but also built upon additional outputs produced within the scope of the research project devoted to the topic of this volume.

2 Structure, Contents, and Key Issues

This volume consists of four parts. The initial part of the volume examines the existing legal framework governing information management both in the public and private sector. Here, the Swiss legal system serves as an example of the kind of Civil Code system of law common to most European countries. By examining the various provisions within the Swiss legal system that concern the regulation of information, the authors were able to identify the—surprisingly few—normative concepts that are applied in the regulation of remembering and forgetting: preservation obligations, disposal regulations, and access restrictions.

The second part of this volume examines in four separate vignettes certain technological phenomena with particular relevance for the subject of remembering and forgetting—namely, search engines, social media, web archives, and the mobile internet. Each of these phenomena finds resonance in the various contributions which make up the third part of this publication.

In the third part, a diverse group of economists, mathematicians, computer scientists, philosophers, sociologists, historians, anthropologists, and psychologists explore different aspects of remembering and forgetting in separate chapters. This rich variety of insights, together with the legal and technological investigations carried out by the lead authors, provides a more holistic view of the phenomenon of remembering and forgetting and the challenges that various disciplines identify for individuals and society at large with regard to this aspect of human experience in the digital age.

In the fourth part, the holistic view is channeled into the composition of a "design guide". This design guide provides a cross-sectional analysis and outlines a process framework across the various thematic contexts and areas of application explored elsewhere in the publication. Ultimately, it offers guidelines for legislators as well as private and public organizations on how to make decisions on remembering and forgetting (personally identifiable) information in the digital age.

Taken together a number of themes can be discerned within the various chapters. These themes have emerged bottom-up; as such, the list of issues dealt with by the contributors is not comprehensive, but arguably representative for the types of

questions that emerge when dealing with a phenomenon as broad as remembering and forgetting in the digital age and addressing it in multidisciplinary context.

First of all, remembering and forgetting are context-sensitive subjects and span across many domains, ranging from problems related to an individual right to be forgotten to broader societal issues like the memory of a nation. The contributions in this volume reflect this diversity of application areas of remembering and forgetting. Examples of contexts addressed here include issues related to identity and reputation,[1] remembering and forgetting in the spheres of politics and governments,[2] and collective memory in organizations, among groups, and within a given nation state or culture (e.g.), among others.[3]

Not surprisingly given the diversity of the phenomenon and the multi-disciplinary character of the inquiry, the contributions—as well as the conversations surrounding them—include important terminological discussions aimed at clarifying what we mean by "remembering" and "forgetting" as the key terms at the core of this collaborative research effort, but also introduce and explore a broad range of technological, social, legal and market phenomena that constitute, shape, or otherwise interact with remembering and forgetting. In some cases, such terminological issues focus on definitions of certain terms like "search engines" or "digital archives".[4] Across the chapters, definitional work not only covers technological aspects, but also includes social phenomena such as "reputation management"[5] as well as for instance legal concepts, including "personal data".[6]

In many instances, the definitions of key terms related to remembering and forgetting in the digital age not only clarify the meaning of the respective terms. Perhaps even more importantly, the definitions are introduced as part of a larger interdisciplinary vocabulary that makes visible the relations between different terms and underlying concepts. Examples include the description of various types of digital archives[7] or the relationship among different types of individual, organizational, and social memory.[8] Viewed from that angle, the articles in this volume

[1] See, e.g., Part III—Technological Developments; Matthias Klemm, "Digitalization and social identity formation", Part IV 6; Melinda Sebastian and Wesley Shumar, "The Digital Age and the Social Imaginary", Part IV 7; Christine Abbt, "Forgetting – In a Digital Glasshouse", Part IV 2.

[2] See, e.g., Mark Schelker, "On the economics of remembering and forgetting in the digital age", Part IV 4; Christine Benesch, "A Political Economic Analysis of Transparency in a Digital World", Part IV 5.

[3] See, e.g., Part V Viktor Mayer-Schoenberger, "Remembering (to) Delete: Forgetting Beyond Informational Privacy", Part IV 1; Christoph Graf, "Remembering Prevails over Forgetting: Archiving of personal Data in the Analog and in the Digital Age," Part IV 9; Sebastian and Shumar, Part IV 7.

[4] Part III—Technological Developments.

[5] E.g., Sebastian and Shumar, Part IV 7.

[6] E.g., Graf, Part IV 9.

[7] Part III 4—Technological Developments, Web Archives.

[8] Mayer-Schoenberger, Part IV 1.

contribute to the development of taxonomy of key terms and concepts associated with remembering and forgetting in the digitally networked environment.

Such a relational taxonomy has not only semantic value and enables research and conversations within and across different disciplines. Rather, the creation of a shared relational vocabulary has the potential to be constitutive for our understanding of the respective phenomena as such. Perhaps one of the most important outcomes of the definitional work across chapters in this respect is the insight that "remembering" and "forgetting" are not simply "opposites" of sorts, but rather complex, interdependent, and symbiotic processes shaped by a broad variety of contextual factors and incentives.[9] Consequently, for instance, "forgetting" is not simply "deleting" of data in the technical sense[10]—another key insight derived from this discussion of definitions.[11]

The taxonomy and relational web of terms and concepts, which emerge from the discussion of definitions across the chapters, already indicate another common thread across the different contributions: the idea of a systemic view on the phenomenon of remembering and forgetting in the digital age presenting its many contexts, drivers, actors, agendas and processes in terms of an ecosystem. While none of the contributions used this exact term, we suggest that the notion of an ecosystem best captures the underlying idea of a systemic view. As noted before, the contributions situate remembering and forgetting in a number of different contexts, covering a broad spectrum from technology platforms to institutional settings and human contexts. Taken together, the following ecosystem layers can be distilled from the discussions:

- Technological: The technological layer is the hardware and software (broadly defined) involved in processes related to remembering and forgetting. A broad variety of technological components have been examined—either as enablers or inhibitors—across the different chapters. Examples include search engine technology (XY), social media,[12] digital archives,[13] and voting advice applications,[14] to name just a few. As further discussed below, almost all of the contributions in this volume analyse the impact of the digital revolution on this layer of the ecosystem.
- Data: Not surprisingly, all contributions examine, in one way or another, the role of data when it comes to remembering and forgetting in the digital age. Several of the contributions suggest that data—increasingly created, shared, collected, analysed, and re-used in digital formats—can be seen as the "raw material" that

[9]E.g., Abbt, Part IV 2.1; Schelker, Part IV 4; Part V 5.3.

[10]Abbt, Part IV 2.1; Askitas, Part IV 3.6; but see Graf, Part IV 9.1, for an alternative view.

[11]Part V 3.

[12]Cf. Technological Developments, Part III 3; Sebastian and Shumar, Part IV 7; Klemm, Part IV 6.

[13]Graf, Part IV 9.3.

[14]Benesch, Part IV 5.

is at the core of remembering[15] and, perhaps surprisingly at a glance—also forgetting through negative selection[16] or deletion.[17] A majority of the contributions, when addressing data layer issues, put emphasis on the quantitative and qualitative changes in the world of data as we have entered the digital age.[18]

- Human: Arguably among the most significant findings of this collaborative research project is the insight that remembering and forgetting in the digital age can only be understood and ultimately governed when considering the human context in which these processes take place.[19] In essence, both remembering and forgetting involve human-driven and thus inherently social[20] processes that transform data into meaningful information, as Abbt frames it in her contribution.[21] The papers vary in their assessment of the relative importance of the human layer vis-à-vis the rapidly evolving technological and data layers of the ecosystem.[22]
- Institutional: To some degree all of the contributions acknowledge the role of a series of factors influencing remembering and forgetting that can be clustered onto what we might call the institutional layer. The discussion of the changing function of archives[23] is a case in point. Other examples that highlight the role of institutional factors include the discussion of market mechanisms,[24] citizen-government relationships[25] as well as the role of the institution known as "law"—particularly data protection law.[26] It is also from such an institutional perspective where connecting lines are drawn between remembering and forgetting and issues related to transparency and accountability.[27]

In addition to exploring some of the key components and dynamics from such a holistic perspective, the contributions identify and analyze structural changes in the ecosystem and evaluate the implications of such changes on remembering and forgetting in the digital age. Across all contributions, much emphasis is on shifts induced by digital technologies in general and the Internet in particular. Collectively, the contributions discuss the various changes in the ways information, knowledge,

[15]E.g., Part III—Technological Developments; Mayer-Schoenberger, Part IV 1; Graf, Part IV 9, and others.

[16]Abbt, Part IV 2.1; Askitas, Part IV 3.4.

[17]Mayer-Schoenberger, Part IV 1.

[18]E.g., Part III—Technological Developments; Mayer-Schoenberger, Part IV 1; Schelker, Part IV 4; Graf, Part IV 9, and others.

[19]Design Guide, Part V 3.

[20]E.g., Sebastian and Shumar, Part IV 7.

[21]Abbt, Part IV 2.

[22]E.g., Mayer-Schoenberger, Part IV 1.

[23]Part III 4—Technological Developments, Web Archives; Graf, Part IV 9.

[24]Schelker, Part IV 4.

[25]Schelker, Part IV 4; Benesch, Part IV 5.

[26]E.g., Mayer-Schoenberger, Part IV 1; Abbt, Part IV 2.3; Design Guide, Part V 6.3.

[27]E.g., Schelker, Part IV 4; Benesch, Part IV 5, Graf, Part IV 9; Part V.

and entertainment is created, disseminated, accessed, and re-used in the digitally networked environment.

Within these transformations, two clusters of issues have been highlighted by a number of contributing authors: interactive platforms for data creation, distribution, and collection[28] at the data layer, and the emergence of large-scale data repositories enabled by dramatically shrinking costs for storage media at the infrastructure layer.[29] As further discussed below, several authors conclude that these technological factors have led to a switch in the default position from forgetting in the analog age to remembering in the digital age.[30] It is in this light that the majority of interdisciplinary chapters examine the societal and legal implications of technology-induced changes—and the respective feedback effects where social or legal norms shape the future development of such technologies.[31]

The penetrating descriptions of the different areas of application of remembering and forgetting, the discussions of the impact of digital technology on these processes, and its multi-faceted interactions with social and legal norms and practices reveal a series of key challenges that deserve attention and further research. Mapping the insights from across contributions, one might group the key challenges into two broad categories: analytical challenges and normative issues.

The analytical challenge, in essence, refers to the problem that the complexity of the phenomenon of remembering and forgetting at the intersection of technology, markets, social norms, and law makes it difficult to examine. The contributions suggest or at least indicate a series of factors that contribute to this complexity, including the speed of technological change[32] and conversely issues related to longevity,[33] information asymmetries and problems emerging from a lack of transparency,[34] blurring lines between spheres and concepts that previously were clearly separated,[35] disintermediation and re-intermediation,[36] the number of actors and decision-makers involved,[37] etc.

The normative challenge interacts at least in part with the analytical challenge. Perhaps most fundamentally, several of the contributions engage in a discussion—either implicitly or explicitly—of the question how the switch in the default from

[28]E.g., Part III—Technological Developments; Sebastian and Shumar, Part IV 7; Benesch, Part IV 5, among others.

[29]E.g., Part III—Technological Developments; Graf, Part IV 9; Part V - Design Guide, Part IV 9.3. However, ensuring the long-term and continuing availability of digital documents entails remarkable costs.

[30]E.g., Mayer-Schoenberger, Part IV 1; Abbt, Part IV 2; Design Guide, Part V.

[31]E.g., Mayer-Schoenberger, Part IV 1; Sebastian and Shumar, Part IV 7; Benesch, Part IV 5; Abbt, Part IV 2; Schelker, Part IV 4; Ullrich, Part IV 8; Graf, Part IV 9; Part V.

[32]E.g., Benesch, Part IV 5.4; Salvati, Part IV 10.5.

[33]E.g., Salvati, Longevity: Remembering and Forgetting Personal Memories, Part IV 10.

[34]E.g., Schelker, Part IV 4; Ullrich, Part IV 8.

[35]E.g., Abbt, Part IV 2; Graf, Part IV 9; Sebastian and Shumar, Part IV 7.

[36]E.g., Sebastian and Shumar, Part IV 7.

[37]See Design Guide, Part V 4.4.

forgetting to remembering should be evaluated.[38] Another recurring theme across these perspectives is the problem of value trade-offs and, in some instances, incommensurability. The perspectives and evaluative criteria that inform the respective assessments vary significantly across authors and contributions, ranging from concerns related to data privacy,[39] the impact on governance systems and accountability[40] to issues related to semiotic democracy,[41] or the ability of future generations to shape their lives based on the remembering and forgetting of the past.[42]

Finally, sometimes explicitly and sometimes rather implicitly, the contributions highlight the important role of time when it comes to issues of remembering and forgetting in the digital age. As noted before, the speed of change—one dimension of time—has been identified as a key characteristic of today's ecosystem in which remembering and forgetting takes place at the individual, organizational, and societal levels. But the role of time is also addressed when discussing issues like preservation of digital information[43] in environments with imperfect backwards interoperability, or when considering criteria such as "relevance" or "timeliness" for decisions-making about remembering and forgetting in specific cases.[44] Indeed, the contributions demonstrate that both remembering and forgetting have to be understood as phenomena fundamentally constituted and shaped by context and time.

[38]E.g., Mayer-Schoenberger, Part IV 1; Sebastian and Shumar, Part IV 7; Benesch, Part IV 5; Abbt, Part IV 2; Schelker, Part IV 4; Graf, Part IV 9; Part V—Design Guide.

[39]E.g., Abbt, Part IV 2; Graf, Part IV 9.

[40]E.g., Schelker, Part IV 4.3; Benesch, Part IV 5.3.

[41]E.g., Sebastian and Shumar, Part IV 7.

[42]E.g., Mayer-Schoenbeger, Part IV 1.3; Graf, Part IV 10.4.3; Design Guide, Part V 4.1.

[43]Part III 4—Technological Developments, Web Archives.

[44]See e.g., Abbt, Part IV 2.3, Ullrich, Part IV 8; Part V—Design Guide.