There is no Software, there are just Services: Introduction

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Digital technologies permeate our daily lives. We access our social networks and the content we produce both individually and collaboratively, and other kinds of information from anywhere and everywhere. Along with the fusion of computers and telephones into smart, mobile devices, these practices are changing the concept and the materiality of software. In the past, shrink-wrapped software, as it was called, had to be purchased, installed on a *personal computer* (PC), configured, and updated regularly. Today, however, it suffices to log on to a single platform and install a *service* to easily access Dropbox, Facebook, Google, etc. In parallel to the development of *clouds*, web services, and mobile apps on the consumer market, "classic" software providers are moving to subscription models in ever-greater numbers: Adobe Creative Suite becomes Adobe Creative Cloud and Microsoft Word becomes Office 365. Software is no longer purchased, but rather can be rented. The world of PCs, in which hardware is embodied in an object and the *operating system* (OS) allows the user to install and execute software, is being transformed. The hardware is getting smaller and diversifying into netbooks, laptops, mobiles

10 and tablets. The possibilities for their use—formerly provided by software in bundled applications and *graphical user interfaces* (GUI)—are now designed in cascades of services. The user's devices merely enable access to services that in turn, access spatially remote hardware and control processes.

This development within the consumer domain corresponds to a shift into *Software as a Service* (SaaS) for business. Accordingly, companies can lease IT-supported administration services for managing their employees, products, and customer data. Hence, hardware purchases are limited to Internet-enabled computers with access to a SaaS provider. There are no expenses to be paid in terms of servers or software, modifications or maintenance by in-house IT departments or external consultants. Instead, the company merely pays access fees. This saves companies money and time and allows them to concentrate on their core business, as the sales pitch goes, and to generate greater profits. Beyond that, promises are made regarding the services' ease-of-use, since these business processes like "product ordering," "delivery," or "payment receipt" are displayed and can be combined with relative ease. This means there is no longer the need to have expert knowledge of programming to optimise IT resources to one's own needs (see Neubert in this volume).

The publishers' thesis, "There is no software, there are just services," describes this situation as a radical break with the previous epoch: Hardware, once objectivized as a physical computer, is becoming distributed across different data centers and dissolving completely into infrastructures. And software, for its part, has to date, controlled the spacio-temporal materiality of hardware and offered up user interfaces, but it is dissolving in a cascade of services that organize access to data and its processing. Ownership of software is thus becoming obsolete, replacing goods as property through service use. This "use-economy" is open to all and promises empowerment: With these new services, everyone has the potential to offer their skills and goods for sale or exchange, as well as reinventing existing services

through combination and modification. It is exactly this interplay between entrepreneurial services and the rising "participatory culture" that corresponds to a process in which any kind of aid or help, personal service or favor—our normal, everyday practices— can be subjected to the law of the economical (see Lison in this volume).

The thesis and title of this this volume refers not only to a situation of historical upheaval, but it may also be understood as a confrontation with a significant systematic argument of media science. The reference is of course Friedrich Kittler's claim that there is no software, but only hardware, because the technical operations occurring within the computers could be reduced to switches in the hardware, which are then merely made human readable by the software (1992). Lev Manovich provoked Kittler's thesis with the technical historical diagnosis, "There is only software" (2013, 147ff.), since all media forms, from photography to painting, have meanwhile dissolved into software in the age of digitalization. To describe the contemporary signature of digital cultures as cascades of queries and operations that are structured by bandwidth and connection speeds (see Parikka in this volume) is less of a reference to a historical upheaval à la Manovich (2013). As a variation of and commentary on Kittler's systematic argument, it is instead suggested here that there could very possibly be no such thing as stand-alone hardware either, because programs and hardware have always been linked as services (see Neubert in this volume). Following Thomas Haigh, one could go even further and say that hardware is part of a complex system, comprising programs, support, documentation, companies, distribution, engineers, and programmers, as well as learning processes and practices (2002, 2013). Hence, the following research hypothesis arises, referring to Kittler's systematic argument: Where hardware is part of a system in which "services"—in the sense of negotiating the use and commodification of distributable software among multiple actors—are crucial (Haigh 2013), it is not the technical conditions relating to

hardware or software technologies that determine the situation, but rather politics and economies as well as practices and cooperative constellations (Erickson and Kelty in this volume; Gießmann and Schüttpelz 2015; Schmidt 2015).

The thesis, "There is no software, there are just services" is thus apodictic and inadmissibly simplified. Of course, there are products that are offered as software even in this age of services. Furthermore, it is yet to be seen whether a radical shift will take place from a software regime to the rule of services. But the pointed assertion is provocative in such a productive way that it practically forces the necessary detailed and sophisticated observation of contemporary developments in the context where services are ubiquitous, that it is likely to have a major stake in the configuration of digital cultures. With their contributions, the authors of this volume present this debate, which can be structured into the areas of *technology*, *practices,* and *economy*. Even if these different perspectives on services seem to overlap, each focus nevertheless yields specific results. In a history of technology informed by media and cultural studies, the interplay between software, services, and hardware becomes clear, quite contrary to the assertion that software does not (or no longer) exist (Neubert; Erickson and Kelty; Magee and Rossiter; Parikka). There have always been services, it is just that their use and emphasis has changed (Haigh 2002, 2013). The strong focus on practices (Fagerjord, Lison, Erickson and Kelty) as well as the economy (Lison, Magee and Rossiter, Parikka) each shows, in a different way, to what extent and with what consequences services as business models permeate other social domains. Thus, this publication takes up positions found in software studies that examine how different forms of software are embedded into the contemporary world. Herein lie issues of how software shapes subjectivities, commonalities, and working forms and how it is modified by them (e.g., the online journal *Computational Culture*; Fuller 2008 and Chun 2006, 2011). By focusing on services and with a differentiated discussion of

the concept in the narrower as well as the figurative sense, this book provides initial orientation for researching services, as well as for effective interventions in a "services culture." The focus on interventions follows from the supposition that the shift toward services could lead to its own form of governmentality. This calls for further investigation and is yet to be explored as a level of critique of service cultures. With this in mind, each of the following illustrations of the individual areas implies particular options for intervention. This book aims to deal with the phenomenon and research field outlines above, but by no means claims to be exhaustive.

Technology

The contributions in this volume address the technological nature of services from a technical-historical viewpoint. From this perspective, the claim that an epochal upheaval is occurring in the transition from software to services invokes an immediate contradiction. As Christoph Neubert argues, what calls for investigation is in fact the relation between hardware, software, and services. This relation, namely, is negotiated anew for each specific historical point in time and against the backdrop of technological and economic developments. In this reconstruction, software appears to be an instable element that mediates between machine and business processes. The modularization and encapsulation of program functions and the blackboxing of those as services, interlocks technological continuities—from *object-oriented* to *agile programming*—with conceptual and dis-cursive shifts. Seth Erickson and Christopher M. Kelty focus on this interlocking of change and stability. Their heuristic approach uses concepts from contemporary theory of evolution in order to identify "patterns of change and stasis, patterns that tend to preserve ancestry" (Erickson and Kelty, 42, quoting Wimsatt and Griesemer 2007, 283). Rather than insisting that abstract distinctions do exist between software and services, in the spirit of Bruno Latour, they ask in which "modes of existence" (2013) do

different forms of software currently occur. Liam Magee and Ned Rossiter have selected the historical development of databases as a historical reference for their contribution. It becomes clear in their recreation, how technological innovation from *relational* and *non-relational databases* accompanies certain "politics of parameters," which in turn correspond to the policies of the organization and knowledge production, regulation, and control. Jussi Parikka takes his cue from Virilio (1999 [a], 1999 [b]) and looks at the disruption and collapse of services, namely through *denial-of-service* (DoS) attacks. In this way, he clearly demonstrates the technological conditions on which SaaS are based: bandwidths, transfer speeds, and the efficient management of traffic come to the fore and reveal how network policy application is involved.

These historical reconstructions point out the moments at which the technological conditions shape the transitions from software to services and their respective regimes. Thus, they signal possibilities for intervention within the interplay of technology, practices, political economy, and discursivations.

Practices

Services exhibit a two-fold relation to practices. First, the technological procedures within the service architectures dictate ways of programming as well as communicative and economic transactions. Thus, the use of files changes, according to Erickson and Kelty (49f.), through the use of apps: These do not just constitute the only access to one's own content in the cloud, they also fuse files to users, accounts, and platforms at the same time. Second, user practices have a reciprocative impact on the technology. Andrew Lison thus describes how the subscription model of Adobe's Creative Cloud makes the illegal cracking of licensed software, like Photoshop, practically impossible. This development seems to be a technical solution to prevent undesirable practices.

Anders Fagerjord shows how a differentiated picture of a technical culture of services can only be arrived at by looking at practices. He looks at the practices of app culture and exposes it as a part of services. The promise of the app industry that apps should be easy to program and use, as well as freely available, is quickly deconstructed, if one looks at the network of actors participating in app production. Contrary to the promises, a monopolization may be on the rise, as the economic policy of Apple demonstrates. These apps can only be programmed and used on Apple devices and are only available via the Apple App Store. Following actor-network theory (ANT), Fagerjord develops a model for analyzing how the combination of different actants and their interests can modify or even undermine the industry's service infrastructure.

Focusing on the practices shows that and how these are designed as operations and operation chains and can thus become translatable into services. By equating these, the productive moment in the interaction of a reciprocative influence of technology, economy, and practices disappears. This is what Lison and Fagerjord highlight to differentiate the software from the service culture. From Fagerjord's refined analysis, based on ANT methods and insights, one could deduce degrees of freedoms, which could help users to defend themselves against being forced into uniformity inside the service regime and to interrupt the cascade of services.

Political Economy

If one focuses on the economic and social effects of the transition from software to services, the promises of companies operating these applications disintegrate rather quickly—promises like freedom and efficient time management. Rather, a new paradigm becomes clear, one that is revealed to be a regime of an all-encompassing service policy (Magee and Rossiter) and service economy (Lison). Markus Krajewski has made important

preliminary contributions to our understanding of why and how technical structures and practices can turn into overarching regimes (2010, 2014). In relation to the question of whether a regime could form a service economy, Krajewski shows that applying metaphors is an integral component of the history of *distributed computing*—which is what the "service principle" referred to here, was called until the 1970s (2014). Metaphors like service, server, client-server architecture, or desktop, are used in information technology to make abstract technologies accessible, according to Krajewski. He points out that in the process, however, the metaphors unleash their own medial and culture-technical power such that technical, economic, and practical development gets promoted via the conceptual horizon of the metaphors in which these technologies are packaged. The metaphoric use of services is consequently not at all innocent but rather a constructive factor of service economies.

In their chapter, Magee and Rossiter point out that the orientation toward service above all entails a policy of control and regulation, which is not only focused on the organization of work but the whole environment itself, as the idea of smart cities demonstrates. The authors point out that since this regime of services goes hand in hand with the expansion of infrastructures that would style themselves as black boxes, it is difficult to arrive at a position outside the system. For Andrew Lison (67f.), services and infrastructures are becoming an ineluctable condition of existence in digital cultures, where they lead us hitherto unknown forms of work, remuneration, and ways of living. Such an example is the service, TaskRabbit, where highly qualified freelancers offer their services over platforms, either to their neighborhood or on the global market; from design through picking up groceries to babysitting. Business with services is quick, self-organizing, and purportedly both the freelancers and customers are happy with it. According to Lison, the problem with this, however, is that the differences between various professions and forms of work (immaterial, material, social-affective) are

dissolving and being bundled into the radical economical impetus we euphemistically call the "exchange economy." Lison tells us this means neither goods, values, nor economic interpersonal relations exist in this regime, but rather only business exchanges that are no longer explicitly declared as such, and omnipresent, never-ending services. Drawing on Lison's argument, one could emphasize his diagnosis by saying both providers and customers become service slaves.

Regarding the issue of how the service regime could be interrupted, it becomes clear that attacks on services are not an option because they have long been integrated into the system. The denial-of-service attack is used by Jussi Parikka to demonstrate the technical foundations of service network politics, which comprise server capacity, the protocols of data traffic as well as bandwidths and the distribution of connection speeds. Parikka suggests that users of services relinquish control over their businesses, communication, and identities, and thus fall prey to the unstable infrastructural conditions distributing the services as well as being victims of the diplomacy of approvals and blockages of services instead of pursuing politically-grounded and legitimate regulation. Parikka hones his assessment of the consequences into the thesis: "There are no services, there are just vouchers" for access to services. He suggests that it is thus conceivable that a regime of services for services is being established in which access to the latter must first be enabled and secured via the former.

Areas of Interest for Interventions

In discussing the thesis "There is no software, there are just services," the economic perspective offers a less-than-encouraging finding. Google and Salesforce.com partnered up in 2008 with the slogan: "Put your office into the cloud!" (Salesforce.com 2008). The aim was to create a profitable business model with apps and software for company collaboration—and it was to

have been limited to this arena. However, this book claims that different service forms and technologies were indeed culminated into one service regime. This can be highlighted by posing the question: How can a business model and a corporate advertising slogan configure everyday digital matters as a regime of services and infrastructures, which furthermore gets promoted in self-organization, as demonstrated by activities performed by the mass of freelancers who are fixated on the sharing economy (see Lison)? In turn, both Neubert's and Erickson and Kelty's analyses, which are informed by media and cultural studies, show that one can only partially speak of a paradigmatic break with traditional software politics and the rise of a service regime. This insight can aid, i. e., in breaking through discursively-, economically-, and praxiologically-generated service logics. Even a look at the practices in the action field of services reveals a space for inter-ruption in the service regime where a pluralization of action instances can be described and thus suggests a relativation of the grand corporate promises of software as service (Fagerjord).

The broad and coarsely grained thesis therefore opens a productive tension for scientific analysis, one that unfurls between thinking through the consequences of service-techno-logics, and deconstructing service regime discourses and technologies. With this in mind, it is possible to develop methods for intervening in the services landscape, and to identify pos-sibilities for counteraction. Looking at the various aspects of services this way becomes necessary due to the signs that eco-nomic primacy is preparing to supersede the technical options as well as the practices that are not primarily economic and thereby to escalate into its own form of governmentality. The creation of such a governmentality may even be enabled by the users and constitute the services being conducted. The users may be invoking and organizing their own self-exploitation. All the while they are in control of their own self-determination and so-called participation as a policy of access to services at the technical and infrastructural levels.

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