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THE SMART CITY CONCEPT AND ITS LIMITS: RESISTANCE, TECHNOLOGY, AND THE FUTURE OF THE CITY

ABSTRACT: This article focuses on the relationship between the smart city concept and the idea of autonomous technology. The problem of resistiveness in advanced Information and Communication Technologies that claim to be “autonomous” is identified as a transcendental philosophical concept that marks conditions of possibility and limits the idea of a smart city and autonomous technology. Furthermore, the article shows that information technology access to reality only achieves the typological, but not the eventful, singular, and concrete quality of experience that is subject to the principle of individuation. Thus, the concept of the Smart City is also overloaded with exaggerated hopes.

KEYWORDS: smart home, political participation, resistiveness, resistance, sustainability

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I. WHAT DOES SMART CITY MEAN?

The idea of the Smart City began to gain traction around the turn of the current century. There have been a number of projects in Europe—often funded by the EU—that address issues subsumed under the concept of “Smart City.” The term is somewhat based on the idea of the “Smart Home” and expands it not only to a presumed heterogeneous urban citizenry but also to non-informatic topics such as climate protection and sustainability, health, mobility, new forms of political participation, etc. The concept is also extended to the surrounding areas. Within the framework of Ubiquitous Computing, “smart home” was practically a fixed component of the program.¹ One’s own four walls should be as comfortable as possible, appropriate to our wishes, and our individual behavior should be socially acceptable. In the Smart City concept, not only the individual is supposed to receive support but the entire city, indeed the whole region in which it is located should as well. Strictly speaking, the associated centralization concept is incompatible with the decentralized principle of the network. In a way, this acknowledges that people seek their happiness not alone, but in community; that their entertainment and private needs should also lie where they work. Urban citizens should also be interested in acceptance and tolerance. It is about accepting individual needs within a certain framework and integrating them into a larger concept of the city, assuming that the interests of people, despite all divergences, are similar. On the one hand, the individual need, the diversity of people, etc., is emphasized, while on the other hand, a type of person is also highlighted who is tolerant and willing to accept and is ready to put up with many things for the sake of efficiency and the acceleration of life. Today, we see that this changes once a certain number of similarly disposed individuals is reached. Studies have shown that people with different value systems no longer strive for adaptation as soon as they can live together with a like-minded larger group in a district and where they make up the majority. Smart City is an attempt to gain control over all areas of life, thus coordinating them and creating a “Smart Citizen” who perceives themselves as part of the informational organizational, informational, and communication system. Specifically, an attempt should also

¹ J. Heesen, “Analyse zu Szenarien einer intelligenten Wohnumgebung,” in J. Heesen, C. Hubig, O. Siemoneit, K. Wieglerling (eds.), *Leben in einer vernetzten und informatisierten Welt. Context-Awareness im Schnittfeld von Mobile und Ubiquitous Computing*, Nexus Schriftenreihe, SFB 627 Bericht Nr. 2005/05, Stuttgart 2005, pp. 149 f.

be made to reduce energy-intensive living, for instance through a “sharing economy.” The “Internet of Things” should be integrated into urban networking and supplemented or expanded by urban and private services that are characterized by their proximity to housing. New ways of digital civic participation in political decisions should be developed. The information techniques should be brought up to date, and cloud technology and AI-supported dialogue systems should be made available. From these applications, one expects efficiency improvements and cost savings. The basis for informatics operations is still human capital in terms of individual knowledge. However, the question is whether this will still be the case with the use of modern dialogue systems, as these primarily generate and process knowledge from texts. This means the system is increasingly distancing itself from concrete authorship, providing indirect knowledge, which does not necessarily have to be worse. So-called human capital will likely shrink in favor of the general availability of knowledge of largely independently operating machines.

Further examination of the Smart City concept is a critical one. It is not a question whether the concept actually brings benefits, but that is not the focus when discussing its limits. Theoretical architectural topics remain largely excluded. While sociological and social psychological aspects still play a role, questions of aesthetics, for example, are set aside. Nevertheless, the question arises whether the digitization of the city does not also impose other requirements. Can the currently developed Smart City concepts truly be realized without changes in urban planning? Must traffic planning change? Must recreational zones be distributed differently? Can urban supply remain as it has been? All these questions are subordinated to the discussion of the technical foundations of the concept here.

The idea of smartness is situated between utopia and reality. One imagines an optimally functioning city-state, analogous to Plato’s Republic, and attempts to design it to be as self-sufficient as possible. The idea of the Smart City attempts to break down the ideal of a digitized society into what is practically achievable in a non-digital context. There are people living in the city who need to eat, work, stay mobile and healthy, and these individuals should be informally supported and relieved. The existing urban society is being optimized with digital assistance to bring improvements for everyone. Whether consciously or unconsciously, the ancient Greek city-state likely serves as a model, which, however, fundamentally contradicts the idea of decentralization promised by a connected and global digital society. Since the city must be supplied, and

also requires an environment as a supply, disposal, recreation, and affordable living space, this is gladly included in the idea of the Smart City. It is assumed that the city can exemplarily demonstrate what is possible with digital support. However, problems that are often not recognized or ignored become apparent when implementing digital recommendations and aids. The realization of the idea presupposes that the population—despite all proclamations of diversity—assumes a certain uniformity in many important respects. Value basis, language, lifestyle, and willingness to adapt to technical specifications vary greatly. Stable parallel societies have developed everywhere, not just in German cities, which hardly engage in exchange with other groups. The language problem is also growing larger. While the existing national language can somewhat be managed through translation machines, the nuances of a grammatically complex language with an extensive vocabulary, which is especially significant in political and cultural contexts, cannot be conveyed adequately. It leads to English, with all its problematic value associations, becoming the *lingua franca* of the digital age and thus finding application in the Smart City as well. In short: not only does the data situation become more complicated, but so does the exchange among citizens.

Let us take a closer look at the fundamentals of the smart city concept. Efficiency, sustainability, and productivity are not everything. Networking is also meant to meet global standards, although it is clear that parts of the world are still excluded from this globality because the necessary technical infrastructure is lacking or the network is completely controlled by those in power. Naturally, there will be preferences regarding information, especially since the goal of optimal service is at stake. Thus, there will be information preferences derived not only from the needs of the users but also from the interests of urban administrations. It is well-known that these interests often do not align. Often overlooked is the fact that there are people who do not want to become “smart citizens” and prefer to handle their affairs independently without municipal support—no matter how citizen-friendly it may be. Even if, in the medium term, it can be assumed that the majority of the population will adapt to digitization, there will still be a certain number of individuals—and these are by no means only the elderly or disabled—who reject integration into the system, especially since the offerings are also associated with surveillance and subtle forms of “manipulation.” This is often downplayed by referring to so-called pull factors. While synergies and organizational support may be desirable, and compromises in privacy protection may be

tolerated, it cannot be assumed that all digital offerings will be accepted. This is particularly true in diverse cities, where the composition of the population consists of parallel societies with vastly different value systems, which makes universal acceptance unlikely. The idea that municipal networks should also provide support for citizen projects sounds intriguing, especially since civic engagement is a municipal priority. However, it is reminiscent of the concept of municipal community television, which was promoted in the 1980s, raising great hopes for increased local citizen participation at the time. In the end, however, people chose commercial television over the often poorly executed municipal alternatives.

The hope for new forms of political participation—such as citizens gathering on new internet platforms—is certainly an interesting supplementary participation offering. However, assuming that this will lead to significantly higher acceptance of political activity is difficult to verify.

Life can become easier through digitization, networking, and the targeted use of intelligent systems. However, the assumption that technology will contribute to the development of grassroots democratization appears speculative. Many ideas of citizen participation, open data, participatory forms of involvement, etc., depend on conditions that presuppose a certain concept of human nature which is not universally shared. This means, first, that the existing heterogeneous concept of human nature is not yet ready for democracy or compromise. Second, it assumes that citizens have embraced technological support—which also involves a surrender of self-determination. Third, the technical framework of participation itself excludes certain citizens. To speak of an expansion of democracy through new digital participation processes seems, at least for now, inappropriate. Even in the older, quasi-“embodied” system of democracy, certain groups, such as people with mobility impairments, were excluded. However, this issue could be partially solved, for instance, through transportation assistance during elections. Furthermore, media-based communication is always subject to manipulation. While media have always played a role in democracy and participation in political decisions, we remain far removed from the idealized visions of the agora or the Rütli Oath.

The creation of “monopoly regions” in Germany, for example, could lead to corrections of narrow constraints—also of a historical nature—caused by state borders and could open up new opportunities for participation. It also provides the possibility of addressing issues of demarcation. However, the idea of the self-organization of informational systems

contradicts the universal claim of technology. Participation in regional decisions, for example in Belgrade, should, for good reasons, be prohibited for Australians, Russians, Americans, and North Koreans.

It is not without reason that there is significant criticism of buzzwords such as sustainability, climate change, digitization, and, of course, the concept of the smart city.² Too often, new technologies are used as tools for processes of societal change. It is true that new media also bring about societal transformations. However, societal change does not necessarily equate to a shift in political power structures. The ruling powers in such contrasting societies as Russia, the United States, and China use advanced system technologies equally to stabilize the societies they control, and they do so with great success. With the help of new technologies, the potential that suits their purposes is exploited—leading to scoring systems and/or surveillance systems, resulting in a “smart” panopticon. This potential is inherent in many advanced technologies but finds its temporary peak, if at all, in information technologies. It is worth noting that precisely these ideas of informational observation, control, and manipulation were already foreseen in classic dystopias of the pre-digital age, such as Aldous Huxley’s *Brave New World*.

This brings us to a discussion of resistance potentials that arise from the technology itself and that must be considered in all municipal and regional applications of information technologies. The fact that not all usage options will be mentioned in the following discussion is not only due to the limited space available but also to the reality that certain technologies will remain unaffordable for the foreseeable future and thus will not be accessible for public use. Thus, for instance, the quantum computer, whose physical design and necessary cooling are so complex that it seems reasonable to forgo its usage potential for the smart city concept, especially as the costs are immense and the benefit to the general public rather low. Let us summarize the key considerations regarding the smart city concept.

1. Even though the smart city concept, like many social and political terms, is vague and rather a collection of ideas and technologies under one umbrella, it is to be noted that it only gains

² S. Sassen, “Talking Back to Your Intelligent City,” 2012; R. Sennett, “The Stupefying Smart City,” 2012; A. Greenfield, “Against the Smart City,” 2013; J. Libbe, “Standpunkt: Smart City: Herausforderung für die Stadtentwicklung,” in *Difu-Berichte*. Deutsches Institut für Urbanistik, 2/2014, 2013; V. Weber, G. Ziemer: *Die Digitale Stadt. Kuratierte Daten für urbane Kollaborationen*, transcript, Bielefeld, 2022, (transcript-verlag.de, Open Access).

public attention and political relevance with a certain level of ambiguity and general accessibility. The smart city concept gains a new quality when AI systems become usable by practically everyone. With the introduction of ChatGPT, the question naturally arises whether the smart city concept can remain completely unaffected by it.

2. In the potential of the smart city, we also discover its limitations. The idea of smartness, of intelligently and cautiously adapting to the behavior and possibilities of a smart citizen, has boundaries where this behavior is so far removed from technical possibilities that certain rationalization methods fail at the value basis of the respective group to which the user belongs. The idea of the urban center's continuity is also dependent on the question of what constitutes this center or how it is defined. The groups of people who want to see things differently regulated and supported are growing in a diverse citizenry. Key points of the definition clash directly and irreconcilably. We tend to observe that existing parallel societies become more closed, and the danger of inaccessibility grows. The hope that it can be bridged through technology, that technical reason and rationality will break down even the hardest ideological and philosophical barriers, is likely in vain. Apparently, certain questions cannot be solved by technology and rationality. Even if technology can be an element of enlightening action, it also allows actions that mock any enlightenment.
3. The concept of the smart city fits wonderfully into the era of demanded digitization. Indeed, there are advantages associated with it. Administrative and organizational matters in particular, are more swift. Especially for a free economy, this results in the advantage of being able to react very quickly to events. However, it is doubtful if technology will benefit everyone. This does not mean negating areas where it brings advantages, but the hope that one can develop these areas without acknowledging the drawbacks would be naive.
4. The concept consists not only of digital advancements but also of advances in life organization, which can naturally turn into coercion; one might also say it is meant to manipulate and steer onto the 'right' track. Although diversity is repeatedly emphasized,

serving specific groups, the problem arises that the individual in the group may not receive service, but is instead viewed only as a type captured through group membership. Those who do not engage with the system will naturally not receive individual service. Planning one's own life may be a disruptive factor. The risk that the concept stands closer to a "Brave New World" than to an Earthly paradise (*Schlaraffenland*) is often overlooked. Without observation and the provision of private data, the advantages will likely not be available to all system participants. The system essentially thrives on observation and data access. Even with earlier use of "smart home" offerings, not all options were accepted. Users realized they often fell under a pull effect and did things they did not really want. Without a persuasion program, without pull moments, the system will not be enforceable. What is generally considered efficient and reasonable may not be so for every individual.

5. The concept is embellished with all sorts of idealistic ballast. The smart citizen is assumed to be interested in efficiency and sustainability. But not everyone shares this interest. Especially in leisure activities, people often prefer detours over efficiency. In addition, it is not uncommon that what is offered and generally considered acceptable is, based on the experience of many, not shared at all and by no means corresponds to their own wishes.
6. We are witnessing urban societies increasingly less able to steer the officially desired degree of divergence. In fact, digital society lives off a shared value base. But precisely this cannot be guaranteed in a highly divergent society. Common values usually exist only as incantatory formulas. What can reasonably be expected of everyone is becoming ever rarer.
7. A further problem arises from the emphasis on urbanity. Thinking follows the categories of the ancient Greek world, in which the city and its surrounding hinterland as a supply area formed a state. Mobility patterns—and not only individual ones—however, contradict the guiding principles of digitalization. After all, decentralization was precisely what the digital age set out to champion. The smart city concept is not the only one to reveal that the hopes for decentralization associated with it have not been fulfilled. Nowhere is the location of a company or an

institution irrelevant. It is assumed that urban life offers more opportunities for social integration while accommodating individual preferences than rural life. The promises of the digital age are thus counteracted by the concept. The hope that one could cultivate the smart citizen independently of economic and institutional interests is also hardly to be taken very seriously.

2. WHAT DOES RESISTANCE MEAN?

This brings us to some important technical aspects of the smart city idea. It becomes clear that the issue of resistance plays a central role.

We will now focus primarily on the technical side of the smart city concept, in which the use of advanced information technologies plays a particularly important role and from which the specific challenges of the concept and its near future can be inferred. Through technical systems, the idea acquires a new quality. Certain processes are organized close to real time. The technologically produced immediacy offers enormous advantages, but it also entails risks, since without human mediation errors can occur that may cause a project to fail—not only due to costs. Errors also occur with human mediation, but as a rule they are noticed more quickly, since one usually first looks for the problem on the side of mediation. Our attention, however, will be directed above all to current technologies and their potentials for resistance. The latter shows that the smart city idea will also be confronted with all kinds of technical problems, because precisely the idea of optimal functionality—and thus the simplification of environmental behavior, optimization of sustainability, simplification of planning, participation, and so on—harbors a great deal of resistance potential. Smartness therefore often runs the risk of proving to be “unsmart.” Things—including technical ones—do not readily conform to our wishes.

Technical forms of resistance are closely linked to physical ones. The discipline of physics is particularly tightly connected to experiences of resistance. Experiences of resistance stand at the beginning of human history—namely psychological, logical, value-setting, and social history, and not least technical history, which is closely tied to physical experiences of resistance. Physics can probably be explained entirely in terms of experiences of resistance: force/counterforce, pressure/counterpressure, light/refraction, and so on. Through technology we can learn ways of dealing with things that “soften” resistance, just as the carpenter learns

to use a plane to make the wood, as it were, suitable for his purposes. All technology serves the fulfillment of purposes. Through experiences of resistance, human beings become *homo faber*. Technology derives its justification from relief on the one hand, but also from the acquisition of new options for action. Technology, like culture, has emerged from experiences of resistance. Yet neither has completely eliminated resistance; rather, they have also generated new ones. Resistance never disappears entirely; instead, it undergoes transformations and shifts. In particular, the smart city concept is also concerned with technical autonomy, that is, with the question of what the system can do more or less independently for the citizen.

What, then, is meant by technical autonomy? As we shall see, the concept is closely linked to that of resistance, since it shows where the limits of processes of autonomization lie and what stands in the way of such processes. The concept of autonomy originates in political philosophy and means “self-legislation.” But what can it mean when we describe a technology as “self-legislating?” The focus here is not on the individual technique of a violinist, but on artifact-based technology that is objectified in tools, machines, and apparatuses. It is information and communication technologies capable of intelligent performance that, in their most advanced development, are described as “autonomous.” Strictly speaking, this designation is incorrect as long as technology serves us as a tool. Autonomy would only be present if it could also refuse its services. Autonomy presupposes that a technology pursues its own purposes. It would thus be capable of acting and would act on the basis of decisions rather than calculations. As an acting entity, it would be capable of assuming responsibility for the consequences of its actions. One can distinguish between strong and weak autonomy. Strong autonomy is what Kant identified as a foundation of ethics, namely the assumption—preceding any ethical discourse—that an ethical being is capable of regulating its will according to a general principle. Concretely, this occurs when it formulates laws that claim universal validity and to which it subjects itself. For system technologies to act in the sense of strong autonomy would require that they themselves are affected by what they do, can be held accountable for their actions, and pursue their own purposes. There would be no reason not to treat such systems as our equals. But why should they support our desires if doing so runs counter to their own intentions? In the case of weak autonomy, which is based on the “voluntary” following of given rules, the situation is different. That a system

follows rules is a trivial insight; after all, this is the basis of every information technology. But what is meant here by “voluntary?” Voluntariness presupposes insight into a rule, that is, a self-consciousness that finds expression, not least, in what Kant calls the “synthetic unity of apperception.” It must be clear that it is I who have had this or that experience, or who have carried out this insight or that action. Kant’s assertion that a “cogito” must be able to accompany all my experiences does not mean that it is always explicitly given. Thus, syntheses of one’s own experiences and insights, as well as an ego-consciousness, would have to be possible.

Since antiquity, causal relations have been interpreted in terms of compulsion. One might now object that in informatic systems causal relations are not at issue in the same way as in mechanical ones. Logical if–then relations are not causal, even if they occur by virtue of physical processes. They are timeless and therefore cannot suffer empirical disturbances. In system technologies, however, situations can arise due to changed data conditions that require a variation of rules or new rules in order to solve a problem. One may think of a computer game in which solutions can only be achieved by changing levels. But does changing have anything to do with voluntariness and insight?

In addition to the above insight about rules, there is another prerequisite: the absence of coercion in action. We realize our will by doing something that we could also refrain from doing. But can a system technology really refrain from acting? Is there an alternative to an action? Of course, we could use a random generator to determine a datum at a certain point from which new “if– then chains” are constructed. But does this have anything to do with voluntariness? Informatic processes are typological. The detection of deviations from rules is not due to historical change that leads to a re-evaluation of a state of affairs, but to the quantitative recording of changes. A system does not evaluate data on the basis of historical change. It may apply different methods to solve a problem, but it is not capable of refraining from solving a problem because it is deemed superfluous - unless it has been programmed that way in advance, in which case, of course, no autonomy is present. Informatic processes are not subject to the principle of individuation. Every operation must be transferable to another system technology or be executable by another computing system. Only in the case of the ultimately inexact operation of the quantum computer do problems arise from transferability. The quantum computer, however, ultimately does not operate exactly and is therefore unsuitable for solving certain problems. What it

does, it does at great expense. Its production and energy consumption, as well as its operation, are costly. It is certainly an unsuitable technology for solving everyday problems. Voluntary actions are decision-based. But what is decision-based is marked by a deficiency. Whoever decides chooses; whoever chooses excludes a possible course of action, can err, and can be held responsible for it. A system can therefore lead us onto a completely wrong track because the conditions on which the idea is based may change—for example, through external influences, not only of a natural but also of a political-historical kind.

A final argument that might seem to support speaking of technical autonomy would be the reference to the fact that even in human beings there is no complete autonomy—an argument that, however, misses Kant's concept of autonomy. Kant pointed out that the human being is a citizen of two worlds: on the one hand, as a natural being, determined; on the other hand, participating in the noumenal world, the world of ideas, and thus able at any time to initiate new causal chains. This is precisely the decisive point of his concept of autonomy. The fact that we are disposed beings, both in a natural and in a historical sense, does not mean that we are exhausted by this determinacy. The fact that in our actions we also orient ourselves toward ideas such as justice, freedom, and equality shows that Kant never assumed absolute human autonomy, but very much did assume the possibility of transcending determinacy. And it is precisely this ability to orient ourselves toward ideas and to realize them in a situation-relative sense that constitutes the special dignity of the human being. The question of the motivation of an action includes individual life histories and historically and culturally shaped influences. Every action can be interpreted socio-psychologically, which does not change the fact that such interpretation rests on evaluations. It does not explain the situational decision of the actor, that is, the termination of deliberation and the decision against one's own dispositions and imprints. Let us assume that "autonomous technology" is characterized by the ability to act independently without an explicit control command. Autonomy here is an attribution that produces effects. Thus, forms of relief are promised that can turn into forms of disenfranchisement when competencies are lost. The dialectic of relief and disenfranchisement is a hallmark of independently acting information technologies.

The idea of autonomy has been pursued since the very beginnings of computer science. From a technical point of view, the transition from automation to technical autonomy in the sense defined above is

a continuous one. At some point, automation processes were meant to take place not only on explicit instruction, but through technologies adapted to life situations—on the basis of data “flowing into” these systems via sensory apparatuses. In fact, we have passed the point at which we can still directly control networked informatic systems. The informatic environment has reached a level of complexity that allows even specialists only occasional, targeted interventions. We can exit a networked system only at the cost of relinquishing informational and practical possibilities and of social isolation.

Autonomous technology in the sense of independently acting technology has a high potential for relief, but also for disenfranchisement, if we entrust life decisions to it. We have become accustomed to background systems organizing our lives for us. The use of such systems goes hand in hand with the promise that the support they provide is compatible with the general interests of society. Advanced system technologies are supposed to be designed according to general, socially acceptable, and legally compliant criteria. A “machine of reason” would then moderate my interests and harmonize them with those of others and with general interests. It would be a machine of stabilization and mediation. This also raises a question of power: who programs this machine? Systems are in principle not neutral, just as no tool can ever be neutral, since it always stands in a means–end relationship.

Let us now turn to the central question: what can be meant by resistance?³ The idea of resistance has appeared in philosophy since the eighteenth century in various forms, without ever becoming an independent theory. In the context of bodily-vital experience of the external world, the discourse reached a peak around 1900 as evidence of its existence,⁴ but it also appears in the development of theories of value.⁵ In psychological contexts it initially receives only indirect attention, and in logical ones practically none at all. However, it gains significance in social contexts, such as in the analysis of institutions. Bollnow extends the discourse by

³ K. Wieglerling, “Exposition einer Theorie der Widerständigkeit.” *Philosophy and Society*, 32, 4, 2021, pp. 641–661; K. Wieglerling, “Technische Autonomie und das Problem der Widerständigkeit,” *Synthesis Philosophica*, 39, 1, 2024, pp. 73–90.

⁴ W. Dilthey, “Beiträge zur Lösung der Frage vom Ursprung unseres Glaubens an die Realität der Außenwelt und seinem Recht (1890),” in W. Dilthey, *Gesammelte Schriften V*, Vandenhoeck & Ruprecht, Göttingen, 1957, pp. 90–138.

⁵ G. Simmel, *Philosophie des Geldes* (1900), *Gesamtausgabe, Band 6*, Suhrkamp, Frankfurt am Main, 1989, pp. 34 ff.

introducing a correlative complement to the concept in the notion of “counter-support” (*Widerhalt*).⁶

The concept of *Widerständigkeit* (resistiveness) is preferred here to that of resistance in order to indicate a higher-order perspective on the problem. In the concept of resistiveness, different modes of experiencing resistance are brought together and identified as transcendental-philosophical concepts. The term is not object-referential; rather, it is a concept of reflection that thematizes the relationship we adopt toward things and states of affairs, toward other persons, and toward ourselves. It qualifies neither as a thing nor a state of affairs, but characterizes an essential aspect of our relation to things, states of affairs, and persons. Resistiveness is experientially accessible, although not necessarily in an object-like manner. It articulates itself in a sense of insufficiency; it is *παρουσία* (presence) without being present in the manner of a phenomenally given and qualifiable thing. Since resistiveness refers to relations, it has a positioning function. What the human being is emerges from the relations in which that human being stands. These relations articulate themselves not least in the form of historical dispositions and an orientation toward the future. To experience resistiveness is at the same time to experience one's position in the world. It is not the only, but an indispensable moment of reality. There is no experience of reality without an experience of resistiveness. Reality is that which ultimately eludes my individual will to form or construct. The attempt, pursued in modern information-technological concepts such as ubiquitous computing or ambient intelligence, to render resistiveness invisible or to circumvent it goes hand in hand with a loss of reality, extending even to psychopathological findings, when levels of reality can no longer be recognized and distinguished.⁷

Experiences of resistiveness are the precondition for self-experience and for the development of competencies, and thus also for the human being's learning and self-understanding as a learning being. Even in my bodily existence I experience that things are not entirely under my control. The value of things and of human beings—illness included—depends essentially on the resistiveness they offer. In the idea of dignity as being an end in itself, a resistance is articulated against the merely typological and against the possibility of being subjected to calculation.

⁶ O. F. Bollnow, *Das Wesen der Stimmungen* (1941), Königshausen & Neumann, Würzburg, 2009, pp. 85–98.

⁷ K. Wiegerling, *Philosophie intelligenter Welten*, Wilhelm Fink, München, 2011.

Resistiveness restrains the human will, but it is more than a moment that merely breaks or inhibits our will. It is a constitutive element of all cognition and theoretical reflection, without which all things would be equally ordered and devoid of cognitive value. Equally ordered things without gravitations would be an unrecognizable noise that allows articulations and disarticulations, but is not itself perceivable or qualifiable—merely an unordered flow of data. Without resistiveness there is no differentiation; without differentiation, no knowledge.

Let us also consider forms of resistiveness that in psychology and sociology are subsumed under the term resilience. The understanding of resistiveness used here has overlaps with resilience, but there is no full equivalence. The discourse on resistiveness has focused primarily on the ontological and epistemological significance of the concept. By contrast, the current psychological and sociological use of resilience seems more closely aligned with the classical understanding of tolerance. *Tolerantia* originally referred above all to the capacity for suffering or endurance of the legionary, who had to cope with deprivation, hardship, injuries, and psychological strain in order to remain capable for action. In a transferred sense, this also applies to functioning within social systems that must maintain their capacity for action under adverse external influences. The stability of a system depends on its adaptability to changing external conditions. This requires individuals within the system to possess a certain capacity for endurance. They must remain functional even when losses, restrictions, and deprivations occur. Resilience, as an expression of psychological and social capacity to bear strain, is regarded as a potential that can be enhanced. However, it can reach a degree that turns into dullness and runs counter to any form of empathy. While this may be a prerequisite for a stable personality, it can become problematic for one's social environment. In the case of technical support systems, adaptation to the character traits of the supported person can become problematic if it ends up reinforcing pathological behavior.

Let us ask, then, which forms of resistiveness can be identified in technology in general, and which in the field of informatic technologies in particular. Technology is not merely an applied form of natural-scientific knowledge; it is also a social construct, shaped by cultural and economic dispositions. Technological developments cannot be decoupled from available resources, economic valuations, societal value preferences, and configurations of power.

What, then, is the situation with regard to concrete experiences of resistiveness? The relativity of resistiveness is articulated, for example, in artifact-based technology. For a tank, the resistance of a stone on the road is marginal; for a passenger car, it is considerable. Experiences of resistiveness stand within a changing practical or theoretical context. Thus, we can focus on one and the same object from different disciplinary perspectives. Let us now name forms of resistiveness according to disciplinary perspectives:

Cultural resistiveness is articulated, on the one hand, in the “poietic” basis of a culture, which for Günter Janich represents an index of cultural maturity.⁸ It manifests itself in a lack of material and intellectual preconditions for the development of technologies. As the Erlangen School has shown, there is a logical order to technological developments: one cannot invent the automobile before the wheel. Cultural resistiveness also expresses itself in patterns of acceptance. Despite all the potential of modern technology to level cultural differences, cultures offer resistance to the development and implementation of technologies through their evaluations of states of affairs. While in Germany there are strong reservations about care robotics—expressed, for example, in the fear that their use will lead to the isolation of those in need of care—they enjoy high esteem in Japan. There, on the one hand, the possibility of a longer independent life is valued; on the other hand, there is a different understanding of shame: people prefer to be cleaned in intimate areas by a care system rather than by a human being. Forms of life give rise to specific technologies. The blowpipe presupposes a specific way of life that requires an efficient instrument for silent hunting. Artifact-based technology and individual technique thus form a functional complex. Operating competence plays a central role in the case of simple tools. In technological development, however, there is a tendency toward a decoupling of the artifact from its operation. Complex technologies are intended to be operable by laypersons. Yet only with the idea of independently acting technology does a complete decoupling seem possible.

The idea of the successful integration of technology is articulated in highly technologically developed cultures in the fact that it disappears from view and only becomes noticeable when it becomes recalcitrant, that is, when it malfunctions. In modern information-technological

⁸ G. Janich. *Kultur und Methode: Philosophie in einer wissenschaftlich geprägten Welt*, Suhrkamp, Frankfurt am Main, 2006, pp. 26–28.

constellations, however, we are confronted with another problem. A technology that acts independently and without explicit operation does not even allow resistiveness to come into view, since its task consists in eliminating or circumventing resistiveness in advance of its appearance. What we cannot perceive, however, we can neither control nor steer. With the disappearance of resistiveness comes a loss of reality. With it, agency also diminishes. A process of disenfranchisement and disempowerment takes place. The loss of resistiveness does not lead us into a realm of freedom, but into a land of plenty in which our participation is no longer required. Finally, resistiveness can also arise from practices of use that do not concern the purpose but the aspect of operation, which does not correspond to cultural practices: the desired purpose can only be realized with difficulty or inadequately using the existing operating apparatus.

Ecological resistiveness is closely bound to cultural resistiveness, since ecological perspectives also arise from evaluations of forms of life. At the same time, it objectifies itself in a threat to organisms, not least to human beings themselves. It manifests itself in limits on available resources or in a re-evaluation of the usefulness of a technology. Ecological resistance belongs, on the one hand, to the category of cultural resistiveness, insofar as it is based on social evaluations, but also, on the other hand, to the domain of natural-scientific resistiveness.

Economic resistiveness concerns the efficiency of technological applications. Technologies may fail to achieve the intended economic purpose if their provision and operation incur higher costs than the hoped-for economic benefit. Energy expenditure and material costs required to manufacture a tool can prevent its use and further development. It is the means–end relation that comes into view under economic preferences. If the relief provided by a technology entails additional economic burdens, its use is inefficient. If it presupposes the multiplication and expansion of customary activities, it is questionable whether this justifies the gain in new options for action. We encounter this in the development of quantum computers, whose added value apparently depends on the field of application. It would be inefficient to use a quantum computer for tasks that can be handled by conventional computers.

Technology-internal resistiveness appears, for example, in material fatigue, which exists not only in classical engineering but also in information technology. It manifests itself, for instance, in material incompatibilities. A specific material can withstand more heat than another. Incompatibilities usually become apparent only with delay. We can speak

of external resistances when environmental factors such as moisture, heat, or vibration act on technology and possibly render it unusable. Coping with internal resistiveness is the subject of engineering practice. Resistiveness in body-based manual techniques or intellectual techniques depends on organic functionalities that can be disrupted by accidents or illnesses.

Let us focus on general forms of resistiveness and ask why certain qualia are not machinally recognizable. Epistemological resistances occur when measuring apparatuses do not function and deliver false results. In such cases, however, we are dealing with technology-internal resistances, not with epistemological resistances that lead to problems of knowledge. Possibilities of control may be absent or insufficient. Even in classical media contexts, problems of resistiveness arise that affect our knowledge. Lighting conditions, film material, and the particularities of the camera can influence our view of things. The documentary character that essentially determined the triumph of photography turned out to be a staging, but also an unconscious misinterpretation of external reality. Just as the moving image provided us with insights into sequences of motion—for example, allowing us to recognize the “floating” of a horse at faster gaits—so too do perspectival settings distort states of affairs and proportions through camera angles and positions. Color values and lighting conditions come into conflict with real conditions. While stagings of external reality were still accessible to image analysis, the same does not apply in equal measure to apparatus-induced mis-mediations of external reality. In image-obsessed times, the situation presents itself differently. Certainly, every theory of representation is problematic, but this also applies to non-mediated, bodily perception. A “pure” representation would not yield knowledge either, since knowledge arises only through emphasis and delimitation, hierarchization and reduction, which is why there is no knowledge without experiences of resistance. The concrete qualia of our perception are not accessible to scientific access because they are subject to the principle of individuation; that is, they are experienced at a specific time in a specific place and arise on the basis of particular projections from prior experience.

Ontological resistiveness accompanies every technology, every technological development, and every formation of individual technique. In classical technology, ontological resistiveness initially articulates itself within existing stocks of being. It enters the world as an ordering factor when technical artifacts, infrastructures, or technically produced goods organize life, that is, establish an order that relieves human beings and

provides them with new options for action. This can be seen exemplarily in mobility technologies, which require rail networks, roads, ports, and so forth. Fuels must be provided, maintenance facilities made available. Our lifeworld is ordered by technologies: information and communication technologies have become our “ready- to-hand,” quasi centers of focus of our work and residential culture. Individual techniques are an invisible tool at our disposal for resisting the adversities of life. They serve to master resistiveness, whether objective or institutional. Means–end relations structure the world in which we live. It is built from “in-order-to motives,” in which technologies occupy a central place. Such in-order-to motives can come into conflict with one another, leading to the setting of preferences or to the abandonment of technical means. Heidegger saw in modern technology, which he called *Gestell* (enframing), a final expression of metaphysics that subjects all beings to calculability. The means becomes the end. Yet technology does not dissolve into calculation, for in its artifact-based and individual forms it becomes a constituent of the world—one that can be changed and transformed, but not wholly abolished. Technology is the poietic stock of a culture and thus the foundation of forms of life. Instrumentality itself can ultimately become the purpose of technical will. Purposive orientations can also refer to technical functionality, to the improvement and optimization of what exists, a condition typical of highly technologically developed societies and one that is also expressed in the smart city concept. Resistiveness, however, also articulates itself historically. Historical change occurs where something eludes calculability, while at the same time accompanying every process of calculation as something that cannot be grasped as an object, but nevertheless makes itself felt. It is the event-like and the singular that characterize historical resistiveness.

As a transition toward a focus on autonomous technologies, let us finally consider the ontological difference that articulates itself as resistiveness in the act of saying “is.” The question concerns the position we assign to technologies in the world and in our lives when we speak, for example, of the age of machines, the information age, or the age of autonomous technology. What does it mean when Capurro,⁹ in reference to Berkeley’s famous dictum, speaks of *esse est computari*? If the entire world is seen as an expression of perfect calculability, this Berkeleyan variation

⁹ 9 R. Capurro, *Homo digitalis: Beiträge zur Ontologie, Anthropologie und Ethik der digitalen Technik*, Springer VS, Wiesbaden, 2017.

captures that condition. But this also means that experiences that elude calculability are marginalized or denied the right to be said to “be.”

Logical resistiveness belongs to the fundamental informatic experience. It appears both in programming processes and in the aggregation of data sets. A result obtained from flowing streams of data may, under certain circumstances, no longer be reproducible, which renders it unusable for scientific purposes, though not for practical ones, such as the control of an operational process. Scientific results concern questions of continuity, which stand for the validity of a result. Continuity, however, can only be established in the typological realm. But what is the typological? This is a question that cannot be answered by quantification alone. Similarity is grounded in an evaluation, an act that is also culturally disposed. Quantitative analyses are something different from the evaluation of states of affairs. Computer science is not “pure” mathematics and is fundamentally situated in an application context. It is always already empirically “contaminated.” The question of how logical relations can be transferred to empirical ones is of fundamental importance. Hegel discussed this question in his *Logic* under the aspect of mediation; Peirce sought a solution to the problem in his diagrammatic foundation of logic, which explicitly refers to Kantian schematism, intended to mediate between the faculty of understanding and receptivity. The empirical cannot escape contingency, which logic seeks to eliminate. Here, too, a problem of mediation becomes visible that challenges every informatic application.

Which forms of resistiveness, then, can be identified in autonomous technologies? Autonomous technologies are information technologies. Classical mechanical technologies lead to automation, not to forms of independent action. Only at the level of a technology that participates in mental processes of organization, control, regulation, and cognition can the idea of autonomy arise. Autonomy in the strong sense, which would also include the refusal of services, is not what is meant when one speaks of autonomous technology. Rather, the issue is a technology that not only acts in an automated way to relieve us, but independently performs tasks without operation and explicit supervision. A certain purpose is to be realized, but the path by which this is achieved is left to the system.

When discussing the limits of autonomous technology, it has become customary to ask whether one is speaking about the current state of technology or about technology in principle. It is then pointed out that both the natural-scientific and the technical access to the world are typological. However, this mode of access cannot grasp the event-like,

which is the object of idiographic methods. Eventfulness or singularity, which are subject to the principle of individuation, are not reached by any technical or natural-scientific method. Only by abstracting from concrete experiential quality can something become an object of such approaches. When we speak of autonomy, we also speak of the possibility of action. In contrast to behavior, action is decision-based. According to Janich, every action is determined by three criteria: responsibility for consequences, autonomy in setting purposes, and rationality in the choice of means.¹⁰ Of these criteria, responsibility for consequences can hardly be fulfilled. Under what conditions could a system be held responsible for the consequences of its actions; and how should this be done, for example by cutting off a robot's energy supply? We could speak of autonomy in setting purposes only if the system pursued its own intentions, that is, had its own interests and preferences. Such a system could no longer be described as a tool. One might argue that it is conceived as a system of reason and that its own interests are identical with the general interests of reason. It would then act in accordance with cultural and moral standards, moderating and harmonizing our desires—something that is also articulated in the smart city idea. But can desires and interests coincide with the general interests of a society? First of all, it is clear that in the case of complete coincidence, the element of compulsion would be eliminated, and thus no ethical impetus would be present. Technical systems are not citizens of two worlds; they have no share in the noumenal world but are entirely part of the phenomenal world. The system's share in ideas is limited to its mathematical stocks, which, however, are not themselves "insighted." There is no execution of evidence, no intuitive grasp, which would presuppose self-consciousness. Thus, only the criterion of rationality in the choice of means remains attributable to a system. Indeed, systems can pursue problem solutions using different means. However, they have no capacity to transcend the given goal or to abandon it "of their own free will." Autonomy presupposes self-consciousness, which is characterized by the following factors: it must possess an identity over time, that is, an inner time-consciousness; there must be a passive synthesis that connects all my experiences with one another as mine. Thus, on the one hand, spatiotemporal formations of the phenomenal world must arise; on the other hand, there must also be

¹⁰ G. Janich, *Kultur und Methode. Philosophie in einer wissenschaftlich geprägten Welt*, Suhrkamp, Frankfurt am Main, 2006, pp. 69–86.

a “transcendental unity of apperception,” which articulates itself in the *cogito* that must be able to accompany all my representations. The quasi-personal unity of a system would therefore have to be given as a temporal identity. Furthermore, an autonomously acting system would have to possess the ability to transcend the experiences it has had, that is, to posit something “historically” new. The capacity for transcendence is a defining feature of human thought. Without it, there is neither the possibility of action nor of decision.

In doing so, do we expose forms of resistance in the context of information systems that claim to act autonomously.

- a) *Principle of individuation*: this concerns a form of resistance that is inaccessible to natural- scientific and technical modes of access. Such access arrives at typologies, not at events and singularities.
- b) *Ontological difference*: a technological system cannot determine itself as a historical entity subject to permanent change and perceiving the world only perspectively on the basis of bodily embeddedness and its binding to a flowing, living present. Even the idea of “embodiment,” widespread in social robotics, does not reach the moment of bodily embeddedness, because it fails to express the difference between *Leib* (lived body) and *Körper* (physical body) and remains within the third-person perspective of the body. A system also fails to arrive at a “historical ontology” because it lacks historical consciousness: it is unable to grasp and evaluate the course of time and to position itself within it.
- c) *Evaluation*: evaluations are made before and after calculative processes, yet they themselves stand within a hierarchical and relational order. The evaluation of historical processes, of things and states of affairs, depends on criteria such as self-consciousness, intentionality, and capacity for action. A system lacks the possibility of self-situating, which does not consist merely in spatial and temporal delimitations, because it does not possess a living present in which past and future touch and which in principle eludes fixation. Historical time is evaluated time - something different from spatiotemporal physical localization, but also from identity-forming inner time.¹¹

¹¹ K. Wieglerling, “Entgeschichtlichung und Digitalisierung,” in K. Koziol (ed.), *Entwicklung der Wirklichkeit: Von der Suche nach neuen Sicherheiten*, München (Kopaed), 2020, pp. 85–119.

- d) *Logical resistance*: logical resistance articulates itself in contradictions and inconsistencies, for example in the idea that something is to be produced in order to serve us, yet at the same time no longer complies with these services because it acts autonomously.
- e) *Resistance of nature*: autonomous systems cannot attain Plessner's first anthropological basic law of "natural artificiality." Even if hardware is subject to aging processes, these are not comparable to those of biological organisms. Biological material is not controllable and steerable in the same way as physical material. Living organisms are open systems that change, are vulnerable, and are mortal.

Immediacy: Plessner's second anthropological basic law of "mediated immediacy" also cannot be attributed to system technology, because it lacks a sense of immediacy and presence, that is, the unifying point of experience that reaches beyond the now. It remains within mediation and knows no immediate reality. The future and the past can only be grasped typologically and perspectively and can never be fully calculated. The present state of Laplace's demon can never be determined, since only a finite amount of data can be taken into account. Every cognitive apprehension of the world is preceded by articulations and disarticulations. For all data captured by measurement, there is corresponding data that is not captured. Moreover, systems lack historical attunement: a sense for aging, for the re-evaluation of data, and for the burden placed upon the present by the past. They know neither spontaneous actions nor action blockages or displacement actions, neither moods that promote action nor those that inhibit it.

Do limits to the claims of autonomous technology now arise from the identification of such forms of resistance? In information technologies there exists a dimension of logical resistance that is bound to their specific processing material: information. Already in cybernetics, information—alongside the physical quantities of matter and energy—was distinguished as a third, independent dimension of processing. Although it is not independent of physical processes, it marks a distinct level of resistance that cannot be treated in terms of physical causality. Logical resistances are violations of the axiomatic conditions of a system. To this sphere we can assign problems of mediation between experience and logical calculus, when information cannot be combined with other information or made to conform to computational operations.

Fundamentally, intentionality, inner and historical experience of time, as well as eventfulness and singularity, are dimensions of resistance that stand in the way of autonomy in both the strong and the weak sense. In the strong sense, because they mark the limits of a quasi-human system technology that has shed its character as a tool and can no longer be seen solely within a means– end relation. But forms of resistance also articulate themselves in the weak sense of a self-acting, “autonomous” technology: the system’s independence is not based on decisions, but on statistical evaluations of incoming data.

Human beings define themselves essentially through what they are capable of producing. That this which is produced often surpasses them in many respects has become a central topos when we speak of advanced AI, not least of “autonomous systems.” We are dealing with a technology that not only surpasses human beings in performance, precision, and efficiency, but is also meant to support them in their social behavior and even to relieve them of an often agonizing pressure to decide. Autonomous systems could thus be regarded as machines of reason insofar as they provide mediation services with overarching societal premises, legal frameworks, and assumptions of equity, that is, insofar as they balance individual and general interests. The idea that the individual possesses a faculty enabling them to act, on the basis of an universally valid principle such as the categorical imperative, even against their own inclinations and desires, would then be delegated to a system technology. This mediation would likely take place in a gentle form that leaves us with the illusion that our particular interests still play a role in system support. What would be lost along the way is the idea of a decision-based and self-directed life. If we were to submit to the guidance of a machine of reason, we would hardly have to reckon with societal resistance any longer. Where resistance to system prescriptions were to arise, programs would likely be initiated that are developed under the concept of “persuasive computing.” The idea that system support should eliminate or circumvent resistances in the realization of intentions is meant to extend even to areas that were previously regarded as accessible only to human beings: the domains of morality, life planning, and political and social organization.

Rules that a system is meant to apply are by no means always appropriate to a given situation, since their situational implementation depends on the cultural preferences and dispositions of the one who is to act in that situation. Fully yielding to a system decision may relieve us,

but total submission and subordination to a machine of reason comes at the expense of situational application. For machines of reason, situational implementations of rules constitute insurmountable forms of resistance, because they reduce complex contexts to typical stocks. They do not attain situational wisdom in Aristotle's sense of *phronēsis*. Autonomous technology represents a new stage in the degradation of the human being, because it harbors the potential for disenfranchisement. It can lead us into a land of Cockaigne, where life becomes easy because we no longer have to live it ourselves and experiences of resistance disappear. The more the human being is relieved, the fewer possibilities for action they have. The path to the land of Cockaigne does not proceed via decision-based actions, but via "liberation" from the need to decide.

Human beings will be understood as embedded in an assemblage with their own creations, within which a self-acting technology plays an essential role. Heidegger's fourfold of sky, earth, mortals, and divinities¹² will be supplemented by the things produced by mortals and placed on an equal footing with them. Yet even the most adaptive and self-acting technology will itself offer resistance. It, too, ultimately fails when confronted with the singular and the event-like, which—like our death—eludes typological access.

Let us deepen the discussion of the smart city concept by focusing on what is currently perhaps the most widely discussed dialog system, ChatGPT. Unlike the discussion of quantum computing, no advanced system technology intervenes so massively in everyday life, becoming usable for laypeople in the way a search system does. This development cannot be ignored in discussions of the "smart city," especially since the user base is already enormous. Just a few months after ChatGPT entered the market in November 2022, authors of factual texts working for institutions and industry complained of massive drops in commissions. Teachers and university lecturers report that pupils and students complete their assignments or seminar papers with the help of ChatGPT. The sudden leaps in performance in both form and content are all too obvious, as are strange, untraceable bibliographic references. Text and image generation are already possible at a considerable level, and even short film sequences can now be produced with dialog systems. It is assumed that self-improving generative AI such as dialog systems will also become capable of ever better results linguistically. In fact, so-called large language

¹² M. Heidegger, *Holzwege*, Vittorio Klostermann, Frankfurt am Main 1950, p. 22.

models (LLMs) and context-sensitive text analyses are capable of this and deliver suitable and usable texts according to the task posed. The more dialog systems are fed with texts, the better they seem to become. However, generative AI does not necessarily only become better or smarter; it can also become worse and dumber. “More” text data and “more” usage data do not automatically lead to better results. This “mass ideology” is widespread but remains as questionable as ever. What matters decisively is the context of use—and there, less can be more. Improvements are to be expected not only in technical terms, but also in dialog management and control capabilities. Beyond narrowly technical improvements, enhancements in dialog management, such as follow-up questions, suggestions, or objections, could also provide advancements. Through skillful input of terms, we can quickly achieve the fulfillment of our search intentions. Dialog systems are, of course, more complex information technologies, but they too are subject to conceptual or natural-language control.

Dialog systems are based on methods of machine learning. However, they are not technologies that become initiative-taking on their own on the basis of a perceived situation in the environment. Even if a system is capable of autonomously completing a story, it does not itself become initiative-taking on the basis of an event, an “insight,” or even an “act of will,” but rather on the basis of control commands or programming: become initiative-taking at time *x* if event *y* occurs. The system is thus user-centered and user-controlled. The more precise the dialog management, the better the result, with the user—and the successful practice of application—ultimately determining the quality of the result. The possibility of self-improvement is tied to many prerequisites, including those related to a system’s historical sense, such as a sense for the change of concepts, for the aging of punchlines, for the performative dimension of speech that appears ironic or sarcastic in certain situations but not in others. Linguistic knowledge alone is not sufficient for this. Linguistic and performative competence are different, as can be seen in autistic individuals on the one hand and pantomimes on the other: the former often possess excellent linguistic competence but lack performative abilities, while the latter exhibit the opposite.¹³

¹³ K.-O. Apel, “Sprechakttheorie und transzendente Sprachpragmatik zur Frage ethischer Normen,” in K.-O. Apel (ed.), *Sprachpragmatik und Philosophie*, Suhrkamp, Frankfurt am Main, 1982, pp. 10–173.

Although public perception of dialog systems focuses primarily on text generation, developers also have additional fields of application in view across various scientific disciplines. In addition to their use in literature research, dialog systems are already being used to generate new medications. Risks arise not only from the potential of the technology, but also from application practices, which bring to light problems that have neither been recognized so far nor derived from already identified potentials. As with any technology, usage practices cannot be predicted. Identifying them requires continuous monitoring of development. Any assessment of the state of the art must factor in development potentials; indeed, we cannot understand enabling technologies at all without interpreting their potentials. In this respect, it is a kind of hermeneutics of the future.¹⁴

Many hope that dialog systems will soon be able to access the entire web and thus become even better and more up to date. Unfortunately, this hope overlooks the fact that unrestricted access also entails access to fake news and the nonsense disseminated online, not to mention manipulations to which statistically operating systems' texts will be subjected. Generative systems can not only become better and smarter, but also worse and dumber.

When it comes to reference to reality, what matters is by no means only the quantity of statistically evaluable material, but also data quality, its conceptual framing, the assignment and attribution of data, and the weighting of data. Heuristic procedures may be superficial and reductive, yet they play a significant role not only in everyday life but also in scientific practice.¹⁵

Central to every experience of reality is the experience of resistance.¹⁶ Experiences of resistance indicate limits of availability. The question of reality itself proves to be more difficult than it appears from the perspective of naïve empiricists who leave the preconditions of scientific

¹⁴ Ž. Radinković, *Hermeneutik der Zukunft*, Dissertation, Universität Stuttgart, 2011; A. Grunwald, *Technikzukunft als Medium von Zukunftsdebatten und Technikgestaltung*, KIT Publishers, Karlsruhe, 2012; K. Wieglerling, "Grundprobleme einer Hermeneutik der Leiblichkeit in Zeiten der Transformation des menschlichen Körpers," *Philosophy and Society*, 25, 4, 2014, pp. 137–154.

¹⁵ H. L. Dreyfus, *Die Grenzen künstlicher Intelligenz: Was Computer nicht können*, Athenäum, Königstein, 1985.

¹⁶ K. Wieglerling, "Exposition einer Theorie der Widerständigkeit," *Philosophy and Society*, 32, 4, 2021, pp. 641–661; K. Wieglerling, "Technische Autonomie und das Problem der Widerständigkeit," pp. 73–90.

experience unexamined. Computer hallucinations obscure resistances and indicate availabilities where none exist. Hallucinations correspond neither to an object accessible in space and time nor to a state of affairs locatable in space and time. Ultimately, only those results should find acceptance that withstand critical examination. What is problematic is an inappropriate trust in the results delivered. Dialog systems can be helpful tools, but also evidence of an increasingly difficult-to-control sorcerer's-apprentice technology and a land-of-Cockaigne technology whose promise of relief turns into disenfranchisement and loss of competence.

The quality of the results delivered by dialog systems depends, on the one hand, on the user's competence in dialog management and, on the other, on the system's adaptive capabilities with respect to the user. From the user's dialog management, the system "adopts" preferences and intentions. On the one hand, the system has no will of its own, no intentionality, and no autonomy, and thus does not leave behind its character as a tool; on the other hand, it opens up its own medial space and is, as a medium, more than a tool: namely a platform for the expression of anonymous system-generated texts, images, etc., which in turn co-determine our social, psychological, and historical-cultural reality. With regard to the further development of dialog systems, it is to be expected that advanced information and communication technologies and robotics will be brought together or integrated. The dialog capabilities of the systems themselves will undergo further optimization, possibly leading to effects such as those depicted in the science-fiction film *Her* (USA 2013) by director Spike Jonze:¹⁷ a young man named Theodore, abandoned by his childhood sweetheart, acquires a dialog system that supports him in everyday life with a pleasant female voice and stands by his side day and night as an understanding dialog partner. He builds an increasingly intimate relationship with the system, which he names Samantha, culminating in a quasi love affair. There are in fact few reasons that stand in the way of realizing such a system. It is to be expected that there will be systems to which we will attribute autonomy, intentionality, and even a will of their own. Many will develop emotional bonds with adaptive systems and will also be disappointed by them: thus, in *Her*, Theodore learns at the end of the film that Samantha maintains similarly intimate relationships with thousands of others. Dialog systems will also play an

¹⁷ S. Jonze, *Her* (USA 2013).

important role in professional life and will further contribute to the dynamization and acceleration of social processes.

The formula from media theory that every new medium also brings compensations for losses of competence seems no longer to hold in the case of dialog systems. The likely erosion of writing and structuring skills can hardly be compensated by an improved ability to control systems through dialog management. At the very least, no symmetries between losses and gains in competence can be demonstrated any longer. Elementary cultural techniques such as reading and writing are prerequisites for many forms of competence acquisition, but also for the development of judgment, which is indispensable for reviewing generated texts and grasping the limits and weaknesses of generating systems.

Not insignificantly, systems can also become dumber. System outputs can thus obstruct our view of the reality of action or lead us to misjudge reality. This may be due to faulty control, data quality, and above all to the system's inability to position itself with respect to the data it processes. Ultimately, however, the problems also lie essentially in the loss of resistance associated with advanced information and communication technologies penetrating everyday life. The dream of automated self-improvement is based on a misjudgment of the role that masses of data play for the correctness of results. Dialog systems may be relieving and highly efficient, but the claim that they allow us to better recognize the reality in which action is to take place holds only to a limited extent. This does not deny that improvements can occur; it merely denies that there is an automatism or necessity of improvement.

Uncompensated losses of competence always affect our capacity for action and thus also the metaethical condition of choice. If I cannot swim, I cannot help a drowning person. Possibilities for responsibility are reduced by the erosion of competence, and the danger of disenfranchisement grows when independent action and the verification of results are no longer possible. As in the case of *Her*, advanced systems—a cinematic anticipation of dialog systems—are capable of clouding our relation to reality. An adaptive system can in fact adapt itself to our habits, expectations, and intentions in such a way that we attribute personal characteristics to it; this now occurs in a manner that has nothing to do with Weizenbaum's relatively primitive ELIZA test.¹⁸ System capabilities

¹⁸ J. Weizenbaum, *Die Macht der Computer und die Ohnmacht der Vernunft*, Suhrkamp, Frankfurt am Main, 1978.

have become so sophisticated that personal attributions virtually impose themselves. Who would not want a dialog partner who is always available, who responds understandingly and empathetically to all problems and questions? It can therefore indeed come to a depersonalization of social relationships. The loss of reality is indicated not least by the fact that adaptive systems lack the resistance that characterizes every personal relationship. People are not available always and everywhere, not even in cases of extreme dependence. Since we ultimately find ourselves with dialog systems in a medial space, resistance-based experiences of reality to which media representations refer can be undermined.

Since generative AI entails a constant transformation of the state of knowledge, it must be assumed that conflicts *with* and transgressions *of* legal frameworks may also arise. Changes in knowledge have an impact on legal frameworks. In the case of generative AI, however, one must expect such an extreme acceleration of the state of knowledge that neither the legal nor the political discourse preceding it can be conducted in an appropriate manner. For reasons of legal certainty, laws cannot be continually adapted to changing states of knowledge; they must therefore possess a certain durability. If, however, on the one hand the attribution of texts can hardly be guaranteed any longer and, on the other, the speed of dissemination can scarcely be curbed, this also has consequences for legal frameworks. What was legally compliant yesterday need not be so tomorrow, without a manufacturer having changed anything at all in the technical preconditions of the system. The acceleration and dynamization of social processes fueled by generative AI can therefore counteract the legal stabilization of society.

The classification proposed in the EU Act into high-risk applications and applications with no or low risk does not do justice to the problem of generative system technologies. An application may carry low risk today but high risk tomorrow, without anything about the technology itself having changed. In any case, the distinction between high-risk AI and low-risk AI can hardly be maintained in the case of generative AI. Even if we focus—as the EU Act reasonably does—on fields of application, this clarity cannot be upheld without difficulty in the case of self-learning systems. Depending on the application, the duration of use, and the intensity of use, a learning and thus changing system can become problematic. The risks of dialog systems are therefore highly dependent on their concrete use.

3. USABILITY, MANIPULATION, AND FALSE HOPES: THE CITY OF THE FUTURE?

Let us therefore summarize what constitutes the smartness of the smart city concept and where the limits of this concept lie, focusing in particular on the use of advanced AI systems, since it can be assumed that these will play an important role in the further development of the smart city concept.

- a) We have been talking about smart cities for a long time, but only after AI systems became, as it were, usable by everyone did the idea reach a new stage. With the introduction of ChatGPT, public discussion has attained a new quality. Smartness has since meant that the “smart citizen” also expects precise operation by an autonomous technology.
- b) Every form of resistance is, as it were, the announcement of a boundary—one that can sometimes be overcome, but sometimes proves to be an absolute boundary that cannot be overcome by technology.
- c) Through the possibility of expanding the concept by using modern information technologies, especially autonomous or self-acting technologies, the narrowing of organization through the information network is reopened—naturally, at the price that concreteness and implementation become more diffuse. On the one hand, the general idea of digitization and networking is preserved; on the other hand, the idea suffers precisely in terms of the concreteness of implementation. Physical, cultural, and psychological realizations differ from place to place. Ultimately, the benefit of information technology is not local and singular, but primarily typological. Thus, precisely when emphasizing the divergence of urban society, it is ultimately not the individual who is served, but the type that identifies the individual as a member of a particular population group.
- d) The system essentially lives off observational data and other forms of data access. Protection of privacy, manipulation, and efficiency gains are in constant conflict here. Users will notice that they are subject to a pull effect when using such systems. One may allow oneself to be persuaded by this, but one does not have to. The ideal state is therefore not achieved, since the world, as it

were, also has a say locally in organizational, productive, and political assistance. Ultimately, the system serves the type, not the individual.

- e) The promises of the digital age are thus, to an extent, counteracted. The hope that the “smart citizen” can be cultivated, as it were, independently of economic and individual interests is also doubtful. The digital economy in particular is far removed from ideas associated with the concept of a social market economy. Society is changing rapidly through system technologies, but not in the sense of political transformation, not in the sense of progressive democratization, co-determination, or participation. Only new forces of information regulation and manipulation have been added. New, seemingly autonomously acting systems influence both the search for offerings and the offerings themselves. The hopes of control and optimization associated with the idea of the smart city are rendered more difficult rather than easier by advanced information technologies.

The future of the city will certainly involve massive support through information and communication technologies. However, it must be doubted that information possibilities will lead to a more participatory and more democratic society. Autonomous and generative technologies in particular tend rather to lead out of the information constrictions associated with the smart city idea. The problem of translating what is logically required into the empirical reality of life ultimately remains unresolved.

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