Acta Univ. Sapientiae, Communicatio, **9,** (2022) 15–34

DOI: 10.2478/auscom-2022-0002

Sustainability versus Web Life Construction

László ROPOLYI
Eötvös Lóránd University, Hungary
e-mail: ropolyi@elte.hu

Abstract. The interpretations of sustainability are varied. In most cases, the focus is on reinterpretations and transformations of human attitudes towards the natural environment and certain (unacceptable) social practices and conditions, i.e. the task would be to shape these spheres of human existence in the interests of sustainability. However, the creation and widespread use of the Internet is fundamentally changing human life that is no longer confined to the natural and social spheres. Web life, as a third sphere of human existence created by the universal use of the Internet, is also a component of human condition, both in itself and through its interactions with the natural and social spheres. It is essential to take this into account: the sustainability of these "three spheres" should be addressed together. The continuous construction of web life can be decisive for the sustainability of the whole human existence.

Keywords: human existence, natural sphere, social sphere, web life, sustainability

1. Introduction

The public use of the concepts of sustainability and sustainable development has a relatively short history (several decades), probably not long enough to have developed a generally accepted version of their meaning. Moreover, these concepts refer to an extremely complex situation that encompasses practically the entire human practice of a historical period, and thus they necessarily have a comprehensive and general meaning, just like a cultural or philosophical concept. Considering several definitions and interpretations (United Nations Information Service (UNIS) Vienna, 2022; Clammer, 2016; Frick, 2016; Heikkurinen–Ruuska, 2021; Internet Society, 2015; Servaes, 2013; Souter, 2012), here we will use as a starting point the proposals of the book called *Sustainability. Fundamentals and Applications* (Surampalli–Zhang–Goyal–Brar–Tyagi, 2020).

Following earlier suggestions, in their view, sustainability can be defined in a broad sense as "the objective of integrating economic activity with environmental

integrity, social concerns and effective governance systems while maximizing the contribution to the wellbeing of the existing generation, fairly sharing the cost and benefits, without compromising the potential for the upcoming generations to meet their needs." Furthermore:

> Sustainable development is a multifaceted and normative concept that evolved during the 1970s as an ecologically centered concept but gradually transmuted into a complete socio-economic-centered concept by the 2000s. The concept contains the philosophies of equality and mutual dependence, among not only the generations but also the nations and peoples of the earth. The concept also incorporates futurity, interdisciplinarity, participation, learning and adaptation for the development of socio-cultural, socio-economical [sic!] and natural environments, which are crucial for the wellbeing of the human race and of nature.

They describe the two main characteristics of this complex praxis as follows: "sustainability is a *people-centered* and *conservation-based* concept", while "sustainable development is a *normative* concept that exemplifies standards of decision and action" (Surampalli et al., 2020).

It is crucial that "sustainable development issues have caused the global community to think beyond the customary classified action of environmental, economic and social concerns and paved the way for an advanced holistic and integrated means of development", i.e. to realize "the integrations and collaborations among the environmental, social and economic domains of sustainability". The *environmental*, *social*, and *economic* domains are called the three pillars of sustainability (Rout–Verma–Bhunia–Surampalli–Zhang–Tyagi–Brar–Goyal, 2020: 4–5).

These views are useful to us because at this point a particular approach to addressing the problems of sustainability can be introduced that makes clear some of the weaknesses of traditional ideas of sustainability and can provide an alternative approach to meeting the requirements of sustainable development in the age of universal Internet use.

An obvious difficulty in such a traditional conception of sustainability is that it is not at all trivial to conceive of the three pillars – environmental, economic, and social domains – as components of a single system or to interpret and describe them within one conceptual framework. To avoid this difficulty, a specific *technological approach* is proposed for each of the three pillars of sustainability. The specificity of this technological approach lies in the fact that technologies are always considered and interpreted in the context of the human/social environment that creates and operates them. This perspective provides an opportunity to identify the values realized by the technologies in operation and to evaluate them from this perspective. This intertwining of technology and society can be called as a *technology–society complex*.

It is clear that both the human-centred and normative features of sustainability can be easily understood in the context of the technology–society complex, an important feature of which is that its characteristics are determined, shaped, and used by actual *human practice* at any given time.

In contrast to most traditional conceptions of sustainability, this allows for a "practice-centred" understanding of sustainability, in which actual (and potential) human practice is the key actor.[1] In this way, the fact that Internet use today is an unavoidable actual human practice can become significant. However, this practice creates and sustains a new kind of complex organism, which includes but also points beyond the technology–society complex (e.g. the values "delegated" to technical devices are different). This new complex is the Internet.

Web life created by the widespread use of the Internet can be seen as a third sphere of human existence, which includes but also modifies and transcends the spheres of natural and social existence. The coexistence of these three spheres of existence is an everyday experience of Internet users. This is the primary reason for the need to address the sustainability of these "three spheres" together.

In what follows, we will first attempt to provide a brief (philosophically informed) overview of the nature and main features of technology and the technology–society complex, with a particular focus on the sustainability issues involved. The second part of the paper will briefly describe some consequences of the emergence of the Internet and web life in order to provide a context for the main proposition of the paper. We argue that a fundamental means of addressing sustainability issues in the age of Internet use is the conscious construction of web life as a means of achieving the joint sustainability of the three spheres of human life.

2. Technology and the Technology–Society Complex

A clear distinction between natural things ("that […] exist by nature") and other – artificial – things ("which are not constituted by nature") is a key issue in the Aristotelian philosophy of nature. Natural things exist by nature because they "contain within themselves the principles of change and permanence" (Aristotle, 1957: 107). Artificial things, on the other hand, do not contain these principles and are therefore created, changed, and maintained by other things. Producing, changing, and maintaining of artificial things is traditionally called technology.

As Hegel once said: "paradise is a garden where only animals can survive, not people". We are forced to create the conditions and circumstances of our own existence for our own survival – and to shape them according to our interests and values. The social system, the social relations, the various segments of social life,

1 Notice that in human practice, all components of the technology–society complex are necessarily represented in a comparable way.

and human existence are artificial constructs: their continuous production and reproduction is the most important human task.

Since the way to produce artificial beings is through technologies, technology is fundamentally inseparable from man; even humans are themselves produced by technologies as well. There are as many kinds of techniques as there are specific kind of human actions. It is easy to identify typical versions such as the way we go about our everyday lives or the production of our social existence or the constructions of various social subsystems. Philosophers prefer to analyse the processes and variations of abstract human activity, e.g. work and production instead of or alongside these.

Technology has an infinite history, but its authentic, i.e. philosophical, understanding, the philosophy of technology – of course – has not. The philosophy of technology is a product of the late modern age, emerging around the middle of the 1960s and focusing on the actual technological difficulties of the age. However, to meet the objective of this paper, a much more general view and understanding of technology is needed. Instead of following in the footsteps of Heidegger, Ellul, or any contemporary philosopher of technology (Olsen–Pedersen–Hendricks, 2009; Sharff–Dusek, 2014), we propose a different philosophy of technology based on a more universal concept of technology (Ropolyi, 2013, 2019). In particular, the concept of technology must be broad enough to include all of its historical forms, primitive toolmaking as well as recent information technologies. No doubt, this is an "essentialist" view on technology since only an essentialist view is capable of accounting for the features that protean historical forms of technology have in common, and hence of identifying the fundamental and universal significance of technology for the human condition.

We propose that the essence of technology is a specific form or aspect of human agency, the realization of the human control over a technological situation. In consequence of the deployment of this human agency, the course and the outcome of the situation are no longer governed by natural constraints but by specific human aims. The human control of technological situations yields artificial beings as outcomes. What is a technological situation? Technological situations are circumstances with a specific character. More concretely, technological situations vary, and they are not homogeneous in nature; so, they can be identified on the basis of their different constituents. The components that make up a technological situation are:

– a given set of (natural or artificial) beings,
– humans (human agencies),
– their aims,
– (situation-bound) tools.

Speaking in a Hegelian way, the essence of technology appears necessarily in concrete, particular technologies only, while, on the other hand, all technologies necessarily embody the essence of technology.

According to this view, every element of the (artificial) human world is created by technologies. Even human nature and social being are the products of our technological activity, and their characteristics are determined by the specificities of the technologies we use to produce them. In other words, humans have a necessarily self-creative nature, and their self-creating procedures are called technologies. Because of the specific representation possibilities (called double or multiple representation strategy) of the human mind (Ropolyi 2013), humans can be the component of a technological situation and at the same time a specific outcome thereof. This anthropological condition will be later identified as a fundamental component of the so-called technology–society complex.

In comparison with widely accepted views on technology, this view implies an extremely general and abstract conceptualization of technological praxis linked to a specific anthropology. Frankly speaking, all human praxis appears as technological, or, better said, as having a technological aspect or dimension. The view on technology proposed above is therefore fairly close to *a philosophy or theory of human practice*. Human practice includes the (imperfect) realization of human control over a situation. Human practice is, of course, not identical with technological praxis, as the former has several other aspects as well, but it always and necessarily has a technological aspect too. Moreover, every human situation can be regarded as a technological situation, every human being as a technological agent, every human goal as accomplishable by a specific technology, and every human tool as a situation-bound technological tool (Ropolyi, 2019).

The technological aspect of human practice is a response to human vulnerability and expresses the intention to gain control over the situations of our lives. Without such a(n evidently partial) success, we would cease to be human beings; we would take part in natural situations as natural – i.e. animal – beings. For this reason, every technology is one of humanity: the human beings, the human world, cultures, and societies are all products of different technologies. Further, technology is the only way humans can create themselves. Human beings were born together with technologies – and technology was born together with human beings.

The technological aspect of human practice, on the other hand, expresses very clearly the so-called "extensional disability" of human beings: we cannot have control over our world as a whole, and it is necessary to split it into such controllable situations that we can control by different technologies. Such technological situations are necessarily limited and finite domains of our complex and infinite world. Craftsmanship or "engineering" can be considered as an ambition to create controllable situations in an uncontrollable world. In this view, engineering is a meta-technological activity, a specific practice of handling the components of technological situations, which aims to set up controllable situations in given, complex, infinitely extending environments.

Various branches of technology can be associated with various types of life situations. Our self-creating praxis is facilitated by a range of economic, legal, psychic, social, cultural, material, mechanical, medical, etc. technologies.

Notice that in this philosophy of technology the concept of situation has a central role. A situation is a (finite or infinite) collection or set of beings that includes as an element at least a human being or a "delegated" human will. Every situation is a human situation. The concept of situation is closely related to the concept of world and the concept of system. Every world includes human beings, so the worlds are human worlds, similarly to what has been declared in the case of situations, but the world is an organized totality around the humans, in contrast to the situation that has no such structure. From a structural point of view, the situation is like a system. A system is a set of beings taken arbitrarily together without any given structure. However, while a situation is given, the system is freely chosen. So, a situation can be considered as a world without structure or a system without constitutive freedom. Based on the above notes, we can speak about control over technological systems, but it is impossible to aspire to have control over the world. As we mentioned above in the practice of the "extensional disability" of human beings, the human world is disjointed into controllable situations.

However, the above description of the nature of technology contains an implicit dilemma that can be identified as the fundamental question of philosophy of technology. This fundamental question is the technology–society relationship, and it has two sides, namely the standpoints regarding the autonomy of technology and the value content of technology. That is, are technology and society independent autonomous entities or not, and are technologies value-neutral or value-laden? Additionally, considering value-laden technologies, what is the source of the values included in technologies and realized during their use (Feenberg, 1999; Ropolyi, 2013, 2019)?

In our view of technology (which was inspired by Feenberg's critical philosophy of technology), the fundamental question can be answered considering the technology–society complex in the context of human praxis. That is, technology and society necessarily coexist in a technology–society complex, which complex is value-laden, and the source of its embedded values can be found in the concrete historical-cultural human praxis.

According to the ideas mentioned before, human and social conditions are artificial ones; every element of the human world is created by technologies. All historical forms of human and social conditions are constructed (and continuously reconstructed) or produced (and continuously reproduced) by historical versions of technology. However, technology has an ontological Janus face: it produces both material and symbolic products, in other words, "things" and "representations", e.g. values. So, *technology* as a specific aspect of human agency, as the realization

of the human control over a technological situation, *is the fundamental creator of the human and social conditions*.

However, *technology is at the same time a human/social product*. As is well known, social (or human) actors (e.g. engineers) have an active, crucial role in the formation and functioning of any technology. That is, given technological and social relations coexist and interrelate to each other in a complex way. Technological products, and even technology itself, are social products.

There is no room to present any details here, so we just call to mind the numerous versions of constructivist ideas on (science and) technology in the sociology of scientific knowledge (Mannheim, Bloor, Collins), in social constructivism (Shapin and Schaffer), in the actor–network theory (Latour), in phenomenological constructivism (Berger and Luckmann), in radical constructivism (Glasersfeld), and so on. There can be found many interesting details in these disciplines regarding the social construction of technologies, but the most comprehensive and convincing view is perhaps the idea of the so-called social construction of technology (SCOT) proposed by Bijker and Pinch (Pinch–Bijker, 1984; Bijker–Hughes–Pinch, 1987), in which detailed descriptions and analyses are proposed on the constructive agents and mechanisms with several well-documented illustrations.

So, the question is: if the (social) human conditions are technological products and at the same time technologies are social (human) products, how can we avoid the circular reasoning in the description of their causal relationships?

In finding an answer, let us take into account that this is not a particularly technology-specific methodological dilemma: it is a well-known difficulty of the understanding of complex systems or of the nature of complexity. In fact, this difficulty can be considered as a (not irrelevant at all) definition of complexity: e.g. a complex system is a collection of a high number of interacting components with mutual determinations that can be explained with circular causality. In other words, due to the appearance of circularity in the causal order, the technology-society conglomeration should be considered as a complex system, which is called in this paper technology–society complex.

However, it is very important that an effective description of complexity has emerged in the history of philosophy: dialectics. Of course, dialectical thinking, or dialectics as a methodology of thinking about complex beings, has constructed different versions with various levels of efficiency. Hegel's dialectics, e.g., can be considered as a genuine understanding of the world as a totality – which is another name in philosophy for complexity.

It seems possible to apply a kind of dialectical methodology to the treatment of the technology–society complex. Since a circular causation relationship has been identified in the technology–society complex, it seems necessary to move to a deeper level of understanding and to uncover the truly fundamental, dominant components within the complex. In our view, these are the humans. As a basic

statement, we propose the following: technologies are human technologies, and societies are human societies. In other words: at the heart of the technology–society complex, we can always find the active, acting human beings. The origin of this complex lies in human practice.

All historical and logical versions of the technological-social complex are created and maintained by human activities through which the people of a given age imagine and try to realize the conditions of their own existence in the given form. The teleology that prevails in this process rests on a fundamental human capacity, which we have previously called the dual (or multiple) representational capacity of the human mind.

This representational pluralism enables humans to interpret anything in two or more ways. For example, we can interpret and identify a natural object as a natural object in itself, and at the same time we can interpret it as a means by which we can achieve an end. That is, people can interpret their own experience in two (or even more) contexts at the same time. This capacity is the basis for tool making and tool use, for the construction of human language, for conceptual thinking, and for countless other human activities. This plasticity is a distinctive human characteristic, not a natural but an artificially created endowment, an endowment of artificially created human nature that is sustained by specific forms of human activity and communities.

Teleology, in a general sense, can be understood as a manifestation of the overlaps and mutual transformations between the mental and the real. However, as a fundamental determinant of human activity, we can also experience this kind of entanglement in myriad concrete ways.

Technical situations produce this very structure. The human agent embedded in the situation sees some individual components of the situation as a tool. Moreover, this human agent perceives the artificial thing, i.e. the technical product, which is created in the situation, as a realization of his/her intentions.

Representational pluralism is also the basis of *self-creation* and *self-construction*. We can imagine and realize situations in which the human being is an "active agent" within the situation and at the same time a "product" of the situation. These interrelations also allow humans to recognize, imagine, and create *complex* beings. In this way, circular causations can be assumed in the relations between things that coexist and interact: for example, technology can be both a creator and a product of the social conditions.

Of course, philosophical reflections on human praxis have a long history and many results in different philosophical traditions. Here we have presented only one specific aspect, highlighting its fundamental role in the construction of the technology–society complex. For now, it is only worth mentioning that further valuable insights into the issues mentioned here could of course be gained by

applying additional social-philosophical and philosophy-of-praxis considerations, and in particular the approaches of the actor–network theory (Latour, 2005).

So, in this view of technology, the fundamental question of philosophy of technology can be answered considering the technology–society complex in the context of human praxis. Technology and society are not autonomous entities, they are necessarily coexisting in a technology–society complex, which complex is value-laden, and the source of its embedded values is the concrete historical-cultural human praxis. In the case of a technological-social complex, there are no permanently separate technological and social values, as they necessarily align during the development of the technological-social complex. Underlying this alignment is the ongoing human practice that constitutes the technological-social complex. The system of values that is organized in the course of such practice can be called *culture*.

However, it is clear, that the technological-social complex can take many, sometimes radically different historical and cultural forms. These are based on different – sometimes radically different – understandings of the humans' self-created needs and different practices of meeting them. Different practices produce different cultures.

3. Sustainability and the Technology–Society Complex

Should the above not have made it clear, let us clarify it right now: unsustainability is in fact inherently built into the nature and functioning of technologies and the techno-social complex. In more senses than one.

3.1. Inherent (Inborn, Natural) Unsustainability

The most important factor is the artificiality of the human nature, i.e. the constant need for people to produce and reproduce themselves. In other words, this means that without the continuous production and maintenance of their own livelihood, humans would lose their humanity and regress back to nature. In other words, artificially sustained human nature is naturally unsustainable. This "natural unsustainability" is ultimately true for all humans: we all have finite lives, and we all die. All humans are mortal, and all human products are destroyed sooner or later.

Natural beings can be considered as eternal beings, but the artificial beings are existing under the power of finiteness. Natural entities are insensible to errors, are errorless, and hence a broken natural entity is ultimately just another natural entity. Artificial entities are sensible to errors, are error-dependent; hence a broken artificial entity is ultimately not another artificial entity. It can lose its artificiality

and fall into the pure naturality. Naturality cannot be lost, whereas artificiality absolutely can (Ropolyi [in press]).

Thus, it is obvious that all technical products, the entire technological-social complex, and, of course, humans as artificial beings will *ultimately fall* into an unsustainable state. Nevertheless, their *temporary sustainable existence* is made possible through those natural situations in which open systems can be organized and maintained through non-equilibrium processes, i.e. their existence is under the condition of a constant exchange of matter and energy with their environment. As long as this metabolism persists, their existence and even their evolution is possible. Such a reaction to natural unsustainability allows the temporary sustainability of beings organized as open systems.

The diversity of living organisms and the long-standing persistence of life itself testify to the fact that open systems can arise naturally: natural *organisms* of varying complexity can be organized, and they populate our natural environment. Some technical processes and the technological-social complex as a whole follow similar laws. In all its states, the techno-social complex is forced to metabolize with its natural environment and functions as an *artificial organism*. Much of the thinking about sustainability is concerned with the conditions for the most harmonious functioning of this artificial organism, e.g. with the creation of a sustainable exchange of materials and energy between the technological-social complex and its natural environment (Surampalli–Zhang–Goyal–Brar–Tyagi, 2020; Heikkurinen–Ruuska, 2021; UNIS, 2022).

3.2. Finiteness and Unsustainability

As is obvious from the above: technologies have an important feature in common: their finiteness. In other words, sooner or later they will inevitably fail, malfunction, or lose efficiency. The situational power of humans and the stability of situations are, of course, limited. Inevitably, changing circumstances will cause a technology that has worked successfully to fail. We will not experience the realization of the desired goal, and our previous successful control of the situation will be damaged.

Strictly speaking, this is what always happens: the operation of technologies is never perfect, and we never achieve exactly the desired goal, but for technologies that are considered successful, occasional deviations are regarded as insignificant, of no practical significance. This way, the effectiveness of technology is largely a practical matter, i.e. its operation is "only" effective in practice, as the perfect realization of our goals is "in principle" impossible. Thus, for example, it can be argued that not only is it impossible to find two identical leaves in the fields, but no two identical "chips" have ever been produced. This is not a problem, however, since the slight differences between the "chips" do not affect their operation significantly (for most of the time they are in use).

Similar processes can be observed in the case of social and moral technologies, e.g. idealized modernist goals have kept the technologies of modern life alive for centuries, but their imperfections and drawbacks have become and continue to be increasingly irreversible, generating a demand for new social technologies (for simplicity, we call them postmodern from the mid-20th century onwards).

In this way, a very important fact is that all technologies are finite in nature, i.e. they exist under the aegis of an ultimate corruption, which means that sooner or later all technologies fail, break down, produce errors, i.e. they eventually lead to undesirable and intolerable results. Moreover, not only all technologies but also the existence of all artificial beings (e.g. human beings) created by technologies is finite.

This finitude is rooted in the complex relationship between each technological situation and the world as a whole. Technological situations can only function in the desired way if their components and relationships are clearly given, stable, fixed once and for all – but because of their embeddedness in the world, the components and relationships of situations are bound to change. Thus, the technical situation inevitably changes, control is lost, and technology becomes flawed. The natural end of all technology is malfunctioning.[2]

However, there are standard methods for some types of technological finite defiance. The most common is maintenance. Maintenance is an "engineering" practice that confronts the deterioration of the technological situation and ensures the proper functioning of technology. It is a continuous re-creation and stabilization of the technological situation, which does not require the same innovations as the original creative practice but can make a fundamental contribution to the practical usability of any technology. It is a co-existing technological and meta-technological practice.

The extended application of successful maintenance practices may lead us to feel that the existence of many technologies can be sustained practically infinitely. But this is not the case. Given that maintenance is also a technology, the ideas presented above imply that its existence is also necessarily finite. In other words, maintenance itself will fail sooner or later. This means that maintenance has to be repeatedly and continuously maintained, which ultimately leads to an infinite and thus practically unfeasible procedure. In this way, it is impossible to avoid the ultimate triumph of failures over technological situations (Ropolyi [in press]).

It is evident that the finiteness of technologies is a fundamental source of the human world's unsustainability. In this situation, the economic, political, and administrative components of the technological-social complex are of great importance. Their effective use can largely ensure the replacement of failing techniques by other eventually effective technologies, thus contributing to

2 As for human technologies, we can recall Attila József's fragment: "and my sins gather into death".

sustainability (UNIS, 2022; Heikkurinen–Ruuska, 2021; Surampalli–Zhang–Goyal–Brar–Tyagi, 2020).

3.3. Extensional Disability

Since every technology is necessarily linked to specific situations and becomes successful through control over them, the world appears to people in the techno-social context as a multiplicity of situations.[3] We are not able to control the world as a whole, as a totality, and are forced to split it into controllable parts and exercise control over them. This *situation-dependence of human success* can be called extensional disability.[4] The main source of this disability is the limitation of human actions and knowledge. The scope of human actions is obviously limited. Universal knowledge, i.e. knowledge that is valid for the whole world, can be created in philosophy and science, but it can only be verified during the processes of concrete human practice, for example in the operation of the technological-social complex.

However, the lack of control over "wholeness" does not eliminate the human desire to control it – and with good reason. For whatever reason, unknown factors in our world can obviously threaten the success of our activities, our technologies, even the safe sustainability of our entire existence. Moreover, the quest for control over the whole world itself generates risks of unsustainability.

Perhaps the most important benefit of the techno-social complex is that, unlike isolated technical endeavours, it is able to draw on adequate scientific, philosophical, and ultimately cultural factors to identify and address the threats in question. This possibility obviously includes the possible expansion of the cultural praxis, for example by launching *scientific, philosophical, or artistic* works to serve the solutions of such problems. In other words, placing any technical endeavour in a social and cultural context can help to address the unsustainability coming from our exceptional disability (Vitek–Jackson, 2008; Clammer, 2016; Surampalli–Zhang–Goyal–Brar–Tyagi, 2020; Goundar–Purwar–Singh, 2023).

3.4. Social and Cultural Unsustainability

In addition to the more or less technology-specific sustainability threats mentioned above, there are other serious threats embedded in the technology–society complex, which are not directly related to one or another technology but to the whole complex. The aspirations that prevail in the techno-social complex as a whole can be well identified in the context of the *dominant culture* of the complex.

3 As Endre Ady wrote, however in a slightly different context: "…and instead of life came only hours".

4 The term "extensional disability" refers to Jácint Farkas's "existential disability" concept (Farkas–Raffay–Dávid, 2022).

It is clear that different cultures and the social practices that underpin them also have different approaches to sustainability and, in some cases, different degrees of sensitivity to its problems. Sustainability can be a cultural and techno-social value in itself. The pursuit of its realization may involve confronting the technology-specific difficulties mentioned earlier, or it may involve the threats individually or all of them at once.

In many cultures, there is a wide gap between the goals set and the results achieved by the human practices that create values. On the one hand, the quality of the "material" products produced by the operation of techniques is much more stable than that of the "representational" products, i.e. values, produced in the same process. On the other hand, it is quite common for the techno-social consequences of a value, as imagined and realized, to be very different. This way, the "built-in" (cultural) failures of value production threaten the sustainability of the techno-social complex.

This situation is well illustrated by the collapse of the culture of modernity and the modern techno-social complex that unfolded during the 20th century. In the following, we will interpret the emergence of the Internet as a human response to the unsustainable modern techno-social complex, as the most important consequence of the modernist failure, with the serious potential for sustainable development.

4. The Crisis of Modernity and the Emergence of the Internet

In the last decades, the technological-social complex has changed radically: the former technologies of material manipulation have been eclipsed by the so-called technologies of representation (information, communication, cognitive, cultural). Today, these (mostly digital) technologies shape the relations of human communities and those of the human world. Internet use is now the most significant actual human practice. All representational technologies are inextricably present in the praxes of Internet use. This practice creates and sustains a new kind of complex organism, which is the Internet and which encompasses the technological-societal complex of our time, but also points beyond it.

To understand the emergence of the Internet, the evolution of its uses, and the rapid spread of its use – three or four decades after its inception, 60 percent of people now use the Internet –, we need to take into account its "ubiquity", i.e. its capacity to permeate and embrace the whole human world. At the beginning of its history, it seemed to be just an unconventional information and communication technology, but this evaluation has changed rapidly – which is not uncommon

for technologies: users' practices, ideas, and needs tend to reinterpret the original design intentions. This is what also happened in this case: as a result of the profound changes generated by users, the Internet has become *a fundamental medium for the human condition*, and today the Internet and its use are an indispensable component that carries and shapes people's lives and culture in a decisive way. It is the interests and values that are and will be asserted in this medium that shape the culture of the times – what we nowadays mostly call Internet culture, *net culture*, or cyber culture. *Web life* is a mode of human existence that is the result of the net-cultural practices of communities organized by the communications on the Internet[5] (Ropolyi 2013, 2014).

To understand the nature and characteristics of net culture and web life, it is worth taking a quick look at the conditions and processes that have led to their emergence. It is fundamental that the whole history of the Internet so far can be seen as a cultural and practical-critical response to the crisis of the modern condition of the world, of modern culture, of modernity, which has been unfolding since the mid-20th century.

The ending of the five hundred years of the modern state of world is the civilizational development that has defined the last decades. The realization of the programme of modernity, including the (unintended) inhuman consequences it entailed, has resulted in a radical devaluation of the visions, achievements, and products of modernity. Thus, a process of economic, political, cultural, and world-system-wide *crisis* has unfolded and deepened throughout the 20th century.

Crisis is the process of transformation of large (complex) systems. It is a process in which the conditions for a complex system to exist in a given way are gradually broken down, the system is dismantled and then reorganized, i.e. a new system is created. Crisis phenomena can be discussed in the context of identifying and understanding this process. The importance of the complexity and size of the system is that there are no consistent descriptions of such systems that can be captured in scientific theories, and thus we cannot use traditional dynamical concepts to interpret their changes. Interpretations and descriptions of crises are a substitute for "dynamical theories" of large and complex systems. As crises unfold, the totality-creating forces (relations of production, ideologies, worldviews, paradigms, stylistic trends, etc.) that had previously worked well lose their effectiveness, the validity of a single "order" and the belief in its validity are undermined, and the world and its perception are pluralized. The formerly accepted version of the "one–many" relationships in which the dominance of the one prevailed is no longer valid, and the pluralistic many temporarily prevails until a new unifying force emerges or is found.

5 Here I prefer to use the term "web life" to describe a new mode of human existence. I am not sure, however, that this is the best way. I can imagine that "netiety" or "netity" or some similar term would also be meaningful.

Intellectual reflections on the crisis of the system of modernity have been identified as *postmodern* stance, which served (and in fact still serves) as the ideology that has determined the interpretation of the world from the mid-20th century until decades later. Its most important declared values are plurality, virtuality, individuality, fragmentation, rejection of power, and the included modernity. The latter implies that the postmodern position does not see the modern value system as something to be abolished altogether but merely seeks to eliminate the absolute dominance of modernity's value system, thus leaving room for the process of transformation of the system.

The most important developments (as the gradual realization of a practical critique of the discredited modern world order) of this period of crisis are:

– the emergence of a new medium, the Internet, capable of accommodating and carrying the new dimensions of human relations;
– concomitantly, the emergence of a new cultural practice, net culture;
– as a consequence of these changes, the emergence of a new mode of being, which we can identify as web life.

As the Internet construction and use can be seen as a practical response to this profound crisis, it is clearly shaped by the postmodern values of the time. This means that during its operation, even independently of the intentions of its users, it is also continuously producing and disseminating postmodern values: the Internet is a postmodern value generator. Over its decades of history, it has, of course, itself been shaped – shaping and defining the content of its values is the most important arena for the ideological struggles of our time, i.e. for defining the cultural nature of web life.

It is a development of extraordinary significance that the emergence of web life does not merely allow for a transformation of the modern condition of existence. The transformation is much more fundamental: the emergence of web life is a direct consequence of the crisis of modernity, but the consequences of the crisis are much more profound. In fact, a radical change is taking place in relation to all previous forms of human existence – and its true significance can only be fully appreciated in the context of the early period of human evolution.

In fact, it could be said that the crisis of modernity can also be seen as a *crisis of all human history* so far and that with the advent of web life a new phase of human history begins. In this way, it is a foregone conclusion that the universal use of the Internet will transform the human condition.

The structure of many millennia is being modified: in addition to the natural and social mode of being, a third mode of being is emerging, one that builds on the first two: web life. Now the humans are citizens of "three worlds": natural, social, and web life relations shape their nature. The culture of the "three worlds" created by Internet use shapes and expresses the changes that are taking place (Ropolyi, 2013, 2014, 2018).

5. Sustainability versus Web Life Construction

In this paper, we introduced the concept of technology–society complex, an important feature of which is that its characteristics are determined, shaped, and used by actual human practice at any given time. In contrast to most traditional conceptions of sustainability, this allows for a "practice-centred" understanding of sustainability, in which actual (and potential) human practice is the key actor.

Additionally, we have argued that Internet use can be considered as the *most significant actual human practice* today, which creates and sustains a new kind of complex organism including but also pointing beyond the technology–society complex. This new complex is the Internet. The functioning of this new organism (sometimes called superorganism) has already created a new sphere of human existence called web life, which includes but also modifies and transcends the spheres of natural and social existence. The coexistence of these three spheres of existence is an everyday experience of Internet users. This is the primary reason for the need to address the sustainability of these "three spheres" together.

It is well known that for thousands of years people have used material technologies (agricultural or industrial) to produce their social conditions, where the material product was the main focus although the symbolic content was also present. In the last several decades, there has been a major technological shift, with the dominance of "representations" over "material" products in the most important technologies of our time. On the one hand, new technologies (cognitive, communication, cultural, and information) have emerged, and, on the other, the representational or symbolic function of traditional technologies has become more important. As a consequence, the most important features of social existence have been fundamentally transformed. The terms "post-industrial", "knowledge", "risk", "information", or "network" society all refer to a type of society where representational technologies are the dominant factor in the (re)construction or (re)production of human nature and social existence.

Already in these decades, sustainability issues were on the agenda, but, understandably, somewhat different ideas were studied in social practices dominated by different representational techniques. All these ideas were, of course, natural precursors to the ideas of the Internet age.

Social constructing practices based on representational technologies, even if they consider only one or two dominant representational technologies (e.g. information and communication techniques) as dominant, make it clear that the use of representational technologies has essentially no harmful effects on, for example, the natural environment, and that the requirement of sustainability can therefore be met much more easily. For example, representational technologies always contain (e.g. individual mental) components that are available in infinite quantities and unlimited availability, for which sustainability is naturally achieved. Internet-

based web life construction practices use all representational techniques, as well as combinations of them, equally and simultaneously, so that the sustainability benefits of representational practices can be more significant.

As web life evolves, so does the importance of the sphere of web life in the human condition as a whole. The determinacy of "human essence" is also changing: its fundamental components were previously determined by a set of social relations, but today this determinacy is increasingly obviously played by relations of gratitude. As a consequence, human relations to sustainability are naturally changing.

In these circumstances, three distinctive approaches to sustainability problems in the Internet era can be identified.

1. Traditional technical approaches. In this approach, the Internet is seen in exactly the same way as any other modern information communication technology (ICT), and the role of the Internet in sustainability is interpreted in a similar way to other modern technologies. Sustainability objectives are not determined by the nature of the Internet or the way in which it is used but are taken as given independently. A question that can be derived from this approach is: How can we use or shape the Internet and its applications to be consistent with sustainability requirements? This is a one-factor situation in which only the contexts that produce the meaning of sustainability are the "active" actors, and the use of the Internet simply has to be adapted to the requirement thus defined (Frick, 2016; Patrignani–Whitehouse, 2018; Shackelford–Douzet–Ankersen, 2022).

2. An environmentally aware technical approach. In this approach, the Internet is seen as a technology relevant to sustainability. Its significance lies in the fact that, as an active agent, it can make a significant contribution to the understanding and implementation of sustainability. For example, the Internet will be relevant to the use of representational techniques that are prevalent in its use and the benefits of these applications. A typical question might be: how and in what ways can Internet use contribute to the definition and implementation of sustainability goals? A two-actor situation emerges: Internet use itself is an active actor, alongside the actor that sets the conditions for sustainability (Duvaut–Dalloz–Menga–Koehl–Chriqui, 2020; Goundar–Purwar–Singh, 2023; Internet Society, 2015; Raut–Kautish–Polkowski–Kumar–Liu, 2022; Roblek–Meško–Bach–Thorpe–Šprajc, 2020; Souter, 2012).

3. A web life constructivist approach. In this approach, the web life construction process of the Internet use is crucial. With the emergence of web life, the whole sphere of human existence is transformed, giving the problem of sustainability a completely different context and a completely new meaning. It makes no sense to talk about sustainability and sustainable development without knowing that the

very essence of the construction of web life is to change environmental, economic, and social conditions that were previously considered unchangeable. The question is rather which relations (e.g. ownerships), in what sense, and in what way we need to change or even maintain in order to transform the whole sphere of human existence.

In this transformation, of course, a myriad of net-using agents is involved, though not in equal measure.[6] Although change would require awareness and a clear objective, these are essentially unattainable requirements for the time being. Moreover, the post-truth culture that is gaining ground today radically relativizes any position. Any public consensus seems unattainable. The situation is therefore uncertain – as are the positions on sustainability. What is certain is that there will be no return to the pre-Internet world and that the debate on all community issues (including the need for sustainable development) will have to be reopened.

So, what is definitely worth addressing is constructing a web life. Its consequences are felt throughout the human world and in fact determine both the possibilities for sustainability of the human world and the potential feasibility of those possibilities.

6. Conclusions

The unfolding human world, consisting of three (natural, social, and web) spheres of existence, typically evolves in a series of rapid and spontaneous changes. All three spheres, and the relationships between them, are constantly changing – the sustainability of each sphere is hardly a sustainable goal in such circumstances. Rather, it is the shaping of the relationships between the spheres, the understanding of their interactions, and the somewhat harmonious shaping of the values of the new human world that may be a reasonable endeavour. This can be realized, above all, in the process of constructing web life. The beginning may be to produce an infinite multiplicity of individual virtual (inexhaustibly and unlimitedly renewable) worlds, encompassing all kinds of human conditions. Maybe something is already emerging – maybe we will survive.

References

Aristotle (1957). *The Physics with an English Translation*. Vol. I–II. Cambridge: Harvard University Press–London: Heinemann.

Bijker, W. E.–Hughes, T. P.–Pinch, T. (eds.). (1987). *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology*. Cambridge, Mass.: The MIT Press.

6 Not everyone can run a revolution, but there are those who can (Ghonim, 2012).

Clammer, J. (2016). *Cultures of Transition and Sustainability. Culture after Capitalism*. New York: Palgrave Macmillan.

Duvaut, P.–Dalloz, X.–Menga, D.–Koehl, F.–Chriqui, V. (2020). *Internet of Augmented Me, I.AM. Empowering Innovation for a New Sustainable Future*. London: ISTE Ltd. – Hoboken, NJ: John Wiley & Sons, Inc.

Farkas, J.–Raffay, Z.–Dávid, L. D. (2022). Fundamental Accessibility and Technical Accessibility in Travels – The Encounter of Two Worlds Which Leads to a Paradigm Shift. *Sustainability* 14: 3765. <https://doi.org/10.3390/su14073765> [Accessed on: 29 September 2022].

Feenberg, A. (1999). *Questioning Technology*. London: Routledge.

Frick, T. (2016). *Designing for Sustainability: A Guide to Building Greener Digital Products*. Sebastopol, CA: O'Reilly Media.

Ghonim, W. (2012). *Revolution 2.0: The Power of the People Is Greater than the People in Power: A Memoir.* Boston–New York: Houghton Mifflin Harcourt Publishing Company.

Goundar, S.–Purwar, A.–Singh, A. (eds.). (2023). *Applications of Artificial Intelligence, Big Data and Internet of Things in Sustainable Development*. Boca Raton, FL: CRC Press.

Heikkurinen, P.–Ruuska, T. (eds.). (2021). *Sustainability beyond Technology. Philosophy, Critique, and Implications for Human Organization*. Oxford: Oxford University Press.

Internet Society (2015). *The Internet and Sustainable Development. An Internet Society Contribution to the United Nations Discussion on the Sustainable Development Goals and on the 10-Year Review of the World Summit on the Information Society*. June 2015. <https://www.internetsociety.org/resources/doc/2015/the-internet-and-sustainable-development/> [Accessed on: 29 September 2022].

Latour, B. (2005). *Reassembling the Social – An Introduction to Actor–Network Theory*. Oxford: Oxford University Press.

Olsen, J. K. B–Pedersen, S. A.–Hendricks, V. F. (eds.). (2009). *A Companion to the Philosophy of Technology*. Chichester: Wiley Blackwell.

Patrignani, N.–Whitehouse, D. (2018). *Slow Tech and ICT. A Responsible, Sustainable and Ethical Approach.* Cham: Palgrave Macmillan by Springer Nature.

Pinch, T. J.–Bijker, W. E. (1984). The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. *Social Studies of Science* 14(3): 399–441.

Raut, R.–Kautish, S.–Polkowski, Z.–Kumar, A.–Liu, C-M. (eds.). (2022). *Green Internet of Things and Machine Learning. Towards a Smart Sustainable World*. Beverly, MA: Scrivener Publishing – Hoboken, NJ: John Wiley & Sons.

Roblek, V.–Meško, M.–Bach, M. P.–Thorpe, O.–Šprajc, P. (2020). The Interaction between Internet, Sustainable Development, and Emergence of Society 5.0. *Data* 5: 80. <https://doi.org/10.3390/data5030080> [Accessed on: 29 September 2022].

Ropolyi, L. (2013). *Philosophy of the Internet. A Discourse on the Nature of the Internet.* Budapest: Eötvös Loránd University. <https://dtk.tankonyvtar.hu/handle/123456 789/12037> [Accessed on: 29 September 2022].

(2014). Prolegomena to a Web Life Theory. *Acta Universitatis Sapientiae, Communicatio* 1: 9–19.

(2018). Toward a Philosophy of the Internet. *APA Newsletter on Philosophy and Computers* 17(2): 40–49.

(2019). Technology as an Aspect of Human Praxis. In: M. Héder–E. Nádasi (eds.), *Essays in Post-critical Philosophy of Technology*. Wilmington, Delaware: Vernon Press, 19–31.

(in press). *Error as the Natural End for Any Technologies*. Paper submitted to the Argumentor Conference 2022, Oradea, 16–17 September 2022.

Rout, P. R.–Verma, A. K.–Bhunia, P.–Surampalli, R. Y.–Zhang, T. C.–Tyagi, R. D.–Brar, S. K.–Goyal, M. K. (2020). Introduction to Sustainability and Sustainable Development. In: Surampalli, R. Y.–Zhang, T. C.–Goyal, M. K.–Brar, S. K.–Tyagi, R. D. (eds.), *Sustainability. Fundamentals and Applications*. Hoboken, NJ: John Wiley & Sons, 3–19.

Scharff, R. C.–Dusek, V. (eds.). (2014). *Philosophy of Technology. The Technological Condition: An Anthology.* 2nd ed. Chichester: Wiley Blackwell.

Servaes, J. (ed.). (2013). *Sustainability, Participation and Culture in Communication*. Bristol–Chicago: Intellect.

Shackelford, S. J.–Douzet, F.-Ankersen, Ch. (eds.). (2022). *Cyber Peace. Charting a Path toward a Sustainable, Stable, and Secure Cyberspace.* Cambridge: Cambridge University Press.

Souter, D. (2012). *ICTs, the Internet and Sustainability: A Discussion Paper*. Winnipeg, Manitoba, Canada: The International Institute for Sustainable Development, May 2012. <https://www.iisd.org/articles/policy-analysis/icts-internet-and-sustainability-discussion-paper> [Accessed on: 29 September 2022].

Surampalli, R. Y.–Zhang, T. C.–Goyal, M. K.–Brar, S. K.–Tyagi, R. D. (eds.). (2020). *Sustainability. Fundamentals and Applications*. Hoboken, NJ: John Wiley & Sons.

United Nations Information Service (UNIS) Vienna (2022). *Sustainable Development Goals.* <https://unis.unvienna.org/unis/en/topics/sustainable_development_goals.html> [Accessed on: 29 September 2022].

Vitek, B.–Jackson, W. (eds.). (2008). *The Virtues of Ignorance. Complexity, Sustainability, and the Limits of Knowledge*. Lexington, Kentucky: The University Press of Kentucky.