Second draft – The Digital Capitalism Debate

Focussing on the human dimension

For a progressive digital agenda

1. Race against the machine?

Technological development has been one of the most influential factors of social development in the past decades. New technologies have brought marked changes to communications, the production and distribution of goods, food production, medical treatment, but also to methods of warfare. More than anything else, it is information technology that has contributed to boosting development of the world economy, integrating existing markets and opening up new ones. And there is no danger that technological development will run out of steam in the years to come.

There is no doubt that a far-reaching technological revolution is in progress at the moment. Digitalisation is changing the world. The interaction of data acquisition, networking, artificial intelligence and robotics is leading to radical global changes in the personal, social and economic sectors. The difference between the new technological revolution and previous developments in digitalisation is the speed of the innovations, their global reach and increased interlacing of the different technologies.

This new quality in digitalisation is driven largely by progress and interaction in three particular areas: First of all, IT and software: Processor performance is increasing exponentially and now facilitates

the use of cloud technologies and mobile applications. The fast-learning algorithms being used today can justifiably be referred to as artificial intelligence. Secondly, robotics and sensor technology: While the size and cost of systems decrease, application possibilities and operability continue to grow. This makes them increasingly interesting for small companies and customised production. Thirdly, and most importantly, networking and connectivity of the systems are creating a "digital ecosystem", in which networks of small computers integrated into various devices and objects can communicate with each other via the Internet.

Even if we cannot currently predict what innovations will be invented and how fast they will be put into practice, the technological facts are more or less on the table already – especially regarding the rapid dynamic developments of the past few years. Still unpredictable are the effects on the economy, on society and on every individual. The question of what is technically possible is already largely answered, but not the questions surrounding the purposes for which these technologies will be used.

Similar to the globalisation discourse of the 1990s, the current digitalisation discourse is both a promise, a threat and reality. Some people regard digitalisation as the ultimate answer to all problems still facing the economy and society, others see the technological developments as an inherent necessity, which there is no point in opposing and which cannot be controlled.

Opportunities usually involve risks. For a lot of people, digitalisation is the magic wand of progressive politics. Others suffer from digital nightmares. The dream of boundless decentralised solutions to the benefit of mankind on the one hand and Internet giants on the other, digital democracy versus hate speech and political trolls, infinite information possibilities versus fake news and echo chambers,

networking of different communities versus the polarisation of debates, personal development versus total surveillance, liberation from routine work versus increased inequality and job loss, the solution of development problems in the global south versus entrenchment of northern supremacy on the basis of technological lead. In contrast to the early days, when information technology was accepted without any large-scale social opposition, further advancement and networking of 21st century technologies will most certainly be met by widespread opposition, since the downside of these technologies is becoming increasingly obvious.

The future political and social importance of digital networking, smart factories, crowdwork and Big Data will depend on how these technologies are utilised. Technology is not an autonomous force, it is developed and applied by human beings. It can be used to entrench and reinforce power and maximise profits, or it can make people's lives and work easier and facilitate social participation. The questions that arise out of this for the political left are the same as those in other areas: Who has access to technology? What needs – and whose – are satisfied by technology? And who actually gets to decide, and how? What kind of society do we want to live in? How can we link digitalisation to other major processes such as sustainable development aims? And what should a political agenda promoting the democratic and emancipated use of technology involve?

These are the reasons why we need a progressive digital agenda. Time for formulating an agenda on this issue is running out on us because the course of digitalisation will be largely decided within the next few years.

Working out an agenda of this kind is not a trivial task. This will involve reconciling apparently conflicting concepts: technological feasibility, social and political development with ecological limitations;   local

policies with global conditions; market elements with the structures of a solidarity-based economy; traditional political hierarchies with grassroots democratic innovations; short-term projects with long-term goals. To achieve this we will have to embark on a culture of search and experimentation as there are a lot of issues which we will not be able to resolve immediately. Nevertheless, we should formulate guiding principles and expectations which will serve as an aid to orientation and action. Especially with regard to digitalisation, which causes much uncertainty, we need something like a "practical utopia" which describes not only the challenges but also the opportunities of what we consider to be successful digitalisation. Less than 50% of the people who have access to the Internet believe that technology is going to improve their lives. We therefore need to create spaces where discussions can be held on how digitalisation can be linked to various social objectives and what role society, politics and the economy are to play in all this.

We know that implementing a progressive agenda will not be a walkover. Any conceivable substantive progressive alternative will challenge systemic orders that reflect powerful (economic) interests. The answer to questions such as "Who owns the data?", "Should we limit the market power of Internet giants, and if so, how shall we go about it?" "How can we ensure that everyone benefits from the digital dividends?", and: "What is the role of trade unions in the digital economy?" will change ownership relations, shift market shares and will decide on power, participation and access. Political and social conflicts (over the distribution of resources) will have a decisive effect on the transition to a new digital structural order.

Our central premise is therefore: digitalisation needs to be shaped and requires social agreements, and in order for us to succeed in achieving this aim, social stakeholders must understand the processes and

effects of this technological revolution and it has to be made clear who is causing it and who is driving it.

2. Digital capitalism

Digital systems are already an established feature in almost all sections of the political economy, as well as in society and social relations. Digital capitalism means that economic and social activity is centred on the exchange of digital information using data networks. Data are the most important commodity and the World Wide Web is the metastructure of the digital economy. The Internet is the backbone of all services within the network economy. Whether we are reading or listening to the news, listening to music, watching films, or simply communicating: The Internet is essential, not only if the entire economy, but our individual lives as well, are to function properly, because Internet access is increasingly becoming equated with participation in social life in general. Digital capitalism is therefore important for both camps: both for the producers and for the consumers.

Digitalisation will fundamentally change the rules of competition and the distribution of added value. Although economic interests often determine both direction and speed, it is becoming increasingly difficult to distinguish between who is driving digitalisation and who is being driven. So what we really need is more in-depth knowledge of the infrastructural, ideological and technical aspects of digital capitalism and of its prevailing forms of economic activity. How does it react, and how does it push technological innovations forward? How does the capitalist economy thrive in the age of digital information? How much responsibility do we want to relinquish and how can we justify this? Will capitalism become a "zero marginal cost society", as Jeremy Rifkin describes it, will we soon be paid for our tweets, as Jaron Lanier

surmises, or do we need to prune the Internet in view of the dangers it holds, as Evgeny Morozov suggests?

Above all, however, digital capitalism is and remains capitalism – together with all the dynamics and discrepancies this involves. Technological change using new production processes and production techniques does not change the relations of production. All this talk about digital capitalism can thus be deceptive, because it suggests that in principle there is a qualitative difference to the capitalism we have known for the past 250 years. The fundamental capitalistic mechanisms still prevail in digital capitalism; categories such as wage labour, profit, private ownership and market still have the same meaning. So in the end, we are still dealing with plain old capitalism, but now in a new guise. There are already signs that digitalisation, unless it is shaped politically, will accentuate the contradictions of capitalism: The effects of the network economy open up incentives and opportunities for monopolies. Some companies involved in the digital economy already have a turnover far greater than the GDP of many states; digital currencies are experiencing a boom although the long-term effects on the money and financial markets cannot be foreseen; labour markets are being polarised, while old inequalities are deepening and new ones are emerging. Digital capitalism, too, is geared towards growth that exceeds ecological limits. There are no visible signs of it pursuing the common good, even if a lot of people emphasize that they are acting in the interests of humanity, and the economic actors are trying to find a way of influencing and limiting the ability of state institutions to shape the future of digitalisation. It is the capitalist's focus on profit which we should pay attention to in our discussions on algorithm ethics, data security and hate speech. If we are to develop effective models for action, it is important for us to realise that some of the apparently technical and abstract debates are really all about capitalism. Up to now, however, the aims of

digitalisation are only being implicitly and explicitly defined in a fragmented player landscape that can hardly meet the demands of democratic legitimation or government review. Thus, the basic question is: How can social and political actors be empowered to shape the digital future and in which sectors do they have to fight for intervention possibilities?

3. Off-line: Digitalisation and inequality

At the moment, roughly 50% of the world's population have access to the Internet. More households have a mobile phone than have access to clean water and electricity. In a few years time, the smart phone will most probably have become a universal product of mankind – the first that the high-tech industry has produced. Success stories, such as the use of cargo drones to deliver urgent medical supplies in Ruanda or the mobile-phone-based payment system M-Pesa in Kenya show how modern communication tools can be used to solve local development challenges.

But these are just a few isolated examples. The digital divide still runs deep. 3.5 billion people – mostly in developing countries – have no access to an Internet connection. At the same time it is apparently becoming increasingly difficult to establish networks in underdeveloped regions and provide the digital infrastructure required for these. While annual growth in the number of Internet users was 17% in 2007, this figure had gone down to only 5.5% in 2018. Beyond these global figures, numerous other "digital divides" in terms of age, income, gender, region, urban/rural community, quality and affordability are emerging: 80% of the inhabitants of Europe have an Internet connection, in Africa only 22%; except in the OECD member states, most small businesses have no on-line connection; two billion people live in countries where prices for 1GB of data exceed 2% of the average monthly wage; women on the whole have a lower access rate; and last

but not least, the lack of language skills, especially a knowledge of English, restricts access to important on-line content. There are strong indications that innovation cycles and digital transformation are accelerating for those who are already on-line, while those who are not yet part of the digital community are experiencing increased problems in gaining access to it. In its 2016 World Development Report, the World Bank comes to the conclusion that it is especially countries in the southern hemisphere which have failed to collect their "digital dividends" up to now. This refers to the hope that the use of digital technologies will achieve widespread positive effects on development, such as growth, more jobs and improved public services. Up to now, only a few well-educated and well-connected population groups have benefitted from these advantages. The main reason for this, apart from the digital divide, is lack of education, but also bad regulatory policies and the tendency to form monopolies. This is not good news, because being off-line not only means being cut off from job opportunities, basic social services, education and information in the form of news, but also from political participation. In view of the increasing connectivity of various key technologies such as nanotechnology, for example, this also means that the digital divide is preventing entire national economies and societies from enjoying the advantages of advanced development in other fields such as medicine, biotechnology and artificial intelligence.

In this way, therefore, digitalisation is not helping to overcome inequality, but is proving to be a multiplicator of such – and not only in countries of the global South. The economical developments of the last 30 years have had two results: a tremendous economic boost and extreme inequality. Today's technologies might also cause further problematic distribution effects: namely mass destruction of routine jobs, mainly in the industrial and emerging countries, by automation, increasing inequality between highly-qualified and less qualified

employees or the encouragement of a "superstar economy", in which certain individuals control an entire market. As one can see, the issues of technology and equality are closely interwoven. Technology is not good or bad, it simply offers opportunities and it is up to us to decide how we want to use these. Affordable access to modern communications technology is the main prerequisite for development in the 21st century, however. xxxx

4. A brave new world of work?

Work is a central aspect of human development. Decent work for decent pay secures peoples' livelihood, reduces inequality, fosters gender equality and strengthens communities. Supporting the struggle for fair and decent work all over the world is one of the core tasks of social democratic parties. Work is fair and decent if it satisfies the requirements of those who are to do it.

The debate on the future of work is not new. It has pervaded social discourses for many years and is a highly controversial issue. Some experts believe that the new technological impetus will destroy jobs on an immense scale, and even forecast the end of work as we now know it. On the other hand, optimists are convinced that the new technologies will push transformative processes forward and ring in a new cycle resulting in a lot of new jobs or even a "golden age" of job creation. The latter theory is supported by the historical experience that despite the fear of technological change, this has always led to the creation of new and better jobs in the end. However, the disruptive character and the speed at which change is taking place may mean that previous patterns of techno-economical change may now no longer recur.

For several decades now, digitalisation of the economy, along with globalisation, has been a major driver of the international division of labour. This trend will intensify in the coming years. The intermeshing

of totally different technologies such as artificial intelligence, 3D printing, smart phones and robot engineering, as already mentioned, is further differentiating the division of labour. The Internet of Things is transforming entire value-creation systems and dissolving the spatial and temporal boundaries of product and labour markets even more. Work is becoming more mobile and more widely distributed. Digital services are being divided into increasingly small sections. The role of the human being in the production process is undergoing transformation – from the person performing a task to the overseer of machines which carry out the routine tasks autonomously. Big Data make sure that sufficient data are available for all sectors. The ability to combine and interpret these data is a key qualification of digital work.

But what will be the labour situation outcome of this upheaval in political terms? This is a controversial issue and it is too early to predict the effects. On the bright side, there is hope for new business models and sectors that will create new jobs, for greater productivity to the benefit of all, for better and healthier workplaces and more flexible modes of work to the advantage of working people, for more sovereign control of one's own time, for better opportunities to set up businesses and for approaches to support an economy of solidarity.

All the same, there is also reason to be sceptical. The "Rise of the Robots" arouses fears that are not totally unfounded: A new wave of automation might indeed lead to the elimination of routine jobs, particularly in the median sector of white-collar work – no longer just in the production sector but also in the service sector and the field of scientific work. Some qualifications are being devalued and the demand for others is growing. Entire professions will cease to exist while new ones evolve. The global and flexible interlinking of various machine systems across corporate boundaries is leading to the separation of gainful employment from companies. On-line platforms now offer individual, sometimes extremely fragmented tasks which

individual self-employed workers perform virtually as piece work. Work tasks are separated from the company context. Employers are reducing or abolishing the scope for autonomy, are tightening up control, Amazon being a "prime" example, are intensifying work procedures and are creating precarious job situations. The trade unions are faced with the problem that it is difficult to assert existing rights, for example concerning industrial safety and health protection, in the crowd-working environment. It can already be seen that in the flexible world of crowd-working, click-working and "human cloud" platforms, where the wage-earner is officially an "entrepreneur", workers are merely employees on short call, with irregular contracts, short-term employment situations, poor social security protection and little protection by trade unions. The "digital precariat", i. e. the number of those in insecure working conditions and who are not registered with the social security scheme, might grow rapidly. Here there is a danger that the digital progress of the 21st century will be combined with the working conditions of the 19th century. In the huge distribution centres run by Amazon, workers do precisely what the Amazon software tells them to do, while the same software registers their productivity in real time. The workers are, in many ways, simply robots – the automation of human beings has begun.

Transition to a digital working world does not mean that all types of work are automatically getting less, but it does mean that the quality of work might deteriorate for very many workers. Digital technologies take over routine jobs and at the same time create a demand for workers performing non-routine tasks. These non-routine activities can be roughly divided into two categories and currently form the two opposing poles of the labour market. On the one hand, digital penetration of the labour market means that abstract, analytical and creative activities are increasing and that the demand for highly-qualified personnel remains high. In this sector, work is performed anywhere around the globe in

the form of projects. The actual geographic location of the person doing the work no longer plays much of a role. At the other end of the qualification spectrum, manual tasks, especially in the service sector (security, hospitality, cleaning branches), dominate. It will take quite a few years before robots are capable of performing these jobs, which call for situation-based action. On the other hand, the qualifications required for such jobs are quite low and so the jobs are usually badly paid. The demand for personnel in both categories of non-routine work has risen in the past few years, but the market for medium-income "routine" jobs has collapsed (partly because customers have taken some of the service activities into their own hands, for example Internet banking, automatic supermarket checkout or on-line searches for cheap flights). This trend to "polarisation of the labour market" will continue and is one of the main driving forces behind the historically wide income disparity in many countries.

At the same time, cheap labour, which up to now has been a major catalyst in helping developing countries catch up with the developed world, may lose in significance: there are already indications that further automation of entire industrial segments will not only affect the structure of national labour markets, but might well change commercial and economic geography as well. If wages play less of a role in the future, market proximity will gain in relevance. Adidas, for example, has started to produce shoes in Germany again – in almost fully automatic facilities. Emerging economies and the developing world might feel the effects of digitalisation even more strongly than industrialised countries. According to World Bank estimates, digitalisation may threaten around 70% of jobs in countries such as India and China.

As opposed to previous technological revolutions, the effects of high-tech industry on employment have remained quite modest up to now. In the USA, only 0.5% of all persons in gainful employment work in the new high-tech branches that have emerged since the turn of the

millennium. The extent of the real effects is still disputed, however, and may differ considerably from one country to another. Whatever the case may be, it is certain that a lot of people will be affected and will have to find new orientation. Very few employees affected by this structural transformation will be able to move on to new, good jobs in the digital sector. The question we need to ask therefore is how can the new digital service and knowledge sector provide a livelihood for everyone? And how can structural transformation be controlled to the advantage rather than to the disadvantage of mankind? At the moment there is no agreement consensus on the future of work. The question as to who will reap the digital dividends has not yet been decided. We don't know exactly what the future holds, but we can still exert our influence on it. A lot will depend on how governments and the social partners manage to shape social, economic and technological framework conditions in order to create new and decent jobs as well as ensure fair and just transitions during the transformation period. Social-democratic and socialist parties must therefore continue to regard structuring of the future work environment as one of their priorities.

5. Private empires? Digital giants

It can hardly be denied that the centres of political power and decision-making have shifted towards the powerful economic players, that core political control functions have been handed over to the economic sector and that there is a strong general focus on the interest of the "markets". Over the past few years this development has been a strong contributing factor to loss of trust in state institutions and the ability of politics to deliver. The tremendous influence that various lobbies have on legislative processes and the ruthless business practices of transnational corporations in individual countries, these often being supported by the country's own government, demonstrate that the

accumulation of economic power and political influence go hand in hand.

This development will be further reinforced in the era of digital capitalism. The winner takes it all: eight billion searches per day, and in some countries as many as 90% of all search activities. Google is the global gatekeeper to information on the Internet and acts as if it had a monopoly in most parts of the world. This is typical for today's digital economy and is reflected in economic terms. According to a current study, of the total 300 billion dollars turnover recently made by all the listed US Internet companies, approximately 70 percent can be attributed to only five companies. 57 percent of all revenue was generated by Amazon and Alphabet. Stock exchange growth of the "big five" amounted to around one trillion dollars in the first ten months of 2017. This increase in value alone exceeds the joint GDPs of Norway, Finland and Denmark. In turn, a few huge investment companies such as BlackRock, Vanguard and State Street, along with state property funds, hold large share packages in these technological giants. Apple itself is also now a financial group with its own financial trading fund headquartered in Nevada and has accumulated corporate bonds amounting to 180 billion USD.

In 2018, the five most valuable companies in terms of market capitalisation were Apple, Google, Microsoft, Amazon and Facebook – they are the ruling class of the digital world. These companies are all large conglomerates which no longer follow one single business model, but which bundle their economic power and convert this in many, often surprising but always data-driven ways: Google runs a global job-search machine and, together with Facebook, controls around 60% of the global on-line advertising market. Facebook offers an Intranet application for government and local authorities and produces TV series. Thanks to its private-label brand "Amazon Basics", Amazon is the USA's largest battery producer and third-largest diaper producer (in

terms of on-line purchases). With its Hololens mixed-reality smart glasses, Microsoft aims to merge digital and analogue elements at the workplace and has become the market's leading standard platform in this sector. Apple is currently working hard on turning the iPhone into a personal health centre and would like to be able to issue virtual credit cards to all its iPhone users. These companies do not shy away from enormous global challenges, like digitising every book that has ever been printed, filming every street in the world, bringing Internet connections to rural areas and sending self-driving cars onto the roads.

Most of Amazon's profit is generated from its mail-order business, but it also profitably rents out unused IT resources via Amazon Web Services, resources without which thousands of companies would have to close down operations. A few financially potent investors are deciding on the developments of the future. With regard to the next major step in the field of artificial intelligence, it is quite probable that a handful of American and Chinese companies will soon dominate the entire AI landscape. In 2016, Amazon invested 13 billion dollars and Google 11 billion dollars in artificial intelligence research and Ali Baba, the Chinese mega-corporation, is also planning to invest ten billion dollars in this field. In order to win this competition, not only is a strong infrastructure needed, but above all, tons and tons of data as the basis for machine learning and deep learning, which is what artificial intelligence is all about. These companies have already accumulated all they need, namely: infrastructure, capital and data.

Powerful platforms acting as intermediaries matching supply to demand undoubtedly form the most characteristic business model of digital capitalism. Google was the pioneer, but now there are several other companies earning a lot of money from sharing services on an Internet platform: Airbnb, the world's largest provider of overnight accommodation, owns no real estate; Alibaba, the world's largest wholesaler, has no product inventory of its own; the world's largest

providers of telephone services, WeChat and WhatsApp, have no proprietary telecommunications infrastructure; Society One, the world's fastest growing bank, has no liquid funds.

Platforms control the access to goods and the processes of the respective business models. The platforms themselves produce nothing, they simply provide a virtual meeting place. Their only possessions are data and algorithms. They are financed through fees, advertising and user data. And thanks to their network effect, they quickly achieve a monopoly position. They often have a disruptive effect on existing sectors, because they serve a private, often more broadly-based market quickly and at favourable conditions. Sometimes they even create this market themselves. In this way, they are often advancing into unknown and unregulated territory. These "intermediaries" strive to achieve market dominance and incorporate more and more sectors into their ecosystem. They do this in order to set and control sectorial standards and to stage every business transaction – even the cost of work – as an auction. The results are early-capitalism working conditions, such as when private transportation is brokered, e. g. by Uber, or micro jobs are provided on click-work platforms such as Amazon's mechanical turk. On these platforms it is the algorithms, and above all the general public, customers and users who do most of the work – and who don't get paid a cent for it. Evaluation systems, also fed by the platform's users, supplant standards, rules, quality labels, labour laws or building regulations.

Jaron Lanier calls these platforms "siren servers" – with reference to the Sirens in Homer's Odyssey – tempting customers with free services with the ultimate aim of forever binding those whom they have tempted. The Sirens were successful as long as there was no turning back. No "turning back" because there are too few alternatives, or it would be too expensive or because everyone else uses the same provider:

Microsoft, Google, Facebook. Thanks to the connectivity and lock-in effect they rapidly achieve a monopoly position. They reserve the right to change the rules of the game whenever they wish. Experiments with payment models, changes to privacy settings are quite common. On the other side, individuals who have absolutely no influence on the overall system face these giants. This applies both to private customers as well as to the many companies utilising the digital infrastructure of the large platforms and technology companies. The platforms are no longer simply market participants, in reality they dictate how the markets work. This means that platforms obtain functional sovereignty: they become the supervisory body and organiser of the actual market participants and can rewrite the rules of the game. Not only on the market, in the core sectors of politics too – keywords cybersecurity, privacy protection, elections, etc. – even though we know very little about their agenda. Criticism of Google and Co. is usually limited to their lax regulations concerning data privacy, the selling of user data or cooperation with the NSA. But what about their attitude to infrastructure policies, standards and regulation?

The Internet companies are clever when it comes to taking advantage of differences between the various national regulatory systems – for example taxation policies – and are gradually becoming a global political force with laws of its own. In contrast, the state is permanently on the retreat, not only from the economy, but from other regulatory sectors, too – either because it considers this to be in its own interest or because it doesn't know on what footing to confront the multi-national high tech companies. In the past few years, a certain renaissance of the state could be observed. However, this was not as a shaping force, but as a crisis manager and stabilising instance when the markets failed to do the job properly. In view of the market power and political clout of a few large companies, public state institutions must regain their status as a central reform instrument which regulates,

sets impulses and limits and boosts innovations on a broad scale. It will be a tough task to develop a public service sector that can challenge the power of Facebook or Google. Anti-monopoly rules, as are being increasingly used in the EU, might help. But we also need new approaches. Yes, it is difficult, but this does not mean it's wrong: in view of the transnational value-added chains, many issues can only be solved at regional or global level. Given the serious challenges facing us, it would be irresponsible to adopt a "tunnel vision" attitude.

6. The fight for data

"Data is the new oil" - a phrase that has become a platitude is now an integral part of any speech on digitalisation. This analogy may have become a cliché, but it is not totally wrong. It usually refers to the fact that data have become the driving force and raw material of a new economy.

All the main platforms create huge volumes of data. Every minute, 72 hours of video material are uploaded to YouTube. 100 billion photos have been posted on Facebook and more than 40 billion apps have been downloaded from Apple iTunes. Estimates vary between a megabyte and a gigabyte of data collected per person per day. Big Data involves a huge volume of unstructured data fed in from distributed sources, and this volume is rapidly expanding. The associated business models are all based on people providing their data voluntarily when they use digital services: every heartbeat registered by an ECG, a cough during a phone call, a swipe across a smart phone, a scan at the supermarket check-out, the use of a navigation system or a health app. Every movement, touch, sound and image caught by a sensor or a camera creates machine-readable data that can be recorded, evaluated, disseminated and sold. More and more networked items such as smart phones, cars, heating systems

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and jukeboxes are feeding in data. In other words, Big Data is an extractive system that mines data from a variety of sources. This raw material then has to be "refined" by combining and analysing the data in order to identify previously unknown patterns and to generate valuable knowledge. Essentially, this is not new. The new thing about it is the sheer volume of data available nowadays thanks to constantly improving data capture and storage methods; new, too, are the intelligence and speed of data processing.

But as in other "extractive industries", data miners produce a lot of externalities, i. e. costs caused by the enterprises and passed on to the population at large, whilst high-tech corporations reap the profits. These externalities range from privacy violations, racism in algorithms to an enormous consumption of resources. On a global scale, data centres emit as much CO_2 as all aircraft traffic together.

The ambivalence of digitalisation is most clearly manifested in the debate on Big Data: on one hand, there are tremendous benefits – not only for businesses – but also for government and local authorities, the healthcare sector and society in general; on the other hand, risks emerge from the technology itself, along with new ethical and legal issues and data security and protection challenges. Fears of total surveillance, loss of personal privacy and freedom are also fuelled by the new developments. The risks arise, in particular, wherever people and social relationships are targeted by data screening, evaluation and forecasts. To start with, it is easier to manipulate people if their preferences are known and their behaviour is predictable. Secondly, feed-back effects may develop when people start to align their behaviour to analysis tools. Data security is becoming a major problem both for corporations and for society. While conventional data processing meant that data were stored separately on local servers, nowadays huge volumes of data are generated by Internet-based communications and are then stored in "clouds". This makes it easier

to feed data in from the network, to combine data from various sources and to access data from different locations. At the same time, however, demands on data security are rising in order to fend off the hazards of unauthorised access and data misuse.

Getting back to the metaphor of data as the new oil: Just as there are oil wells which we should not tap, there are data sources which we should not use because the cost to society is too great. Other sources can be used, but only if strict protection standards and the greatest possible transparency are applied. In this context it is critical to achieve transparency of the "refining processes", i. e. the process of converting raw data into information and knowledge, by disclosing the algorithms that are applied. This is the only way that policy-makers and society can find out when and where new regulations are necessary. And, one final aspect: it is important to ensure democratic control. Neither an oil-drilling platform nor a data platform should be set up if society does not want them.

In the coming years, the issue at stake will be nothing less than establishing a new set of data ownership rules. Data can be reproduced as often as one wants. Whenever we share data with others, we increase its value. But in order to make use of this value, we have to organise the digital world in a different way than the material world. Similar to all other extractive industries, data extraction activities need transparency, clear rules and democratic participation.

In this respect, time is short, since the big technology corporations and the leading IT-countries associated with them are attempting with all their might to define the rules to suit their own interests and to prevent the establishment of data governance in the interest of the general public.

7. The new trade route: Digital trade and commerce

The Internet is increasingly becoming the 21st century's leading trade route and the politics of international commerce are becoming one of the major arenas for discussing, and possibly determining, new rules on "digital capitalism".

Amazon, Google, Uber, Airbnb and many others have radically changed the way we handle products, and to a constantly increasing extent also services, across national borders. Ordering and paying via the Internet is not only convenient, it also lowers trading costs. This is why the proportion of on-line trading has increased enormously in recent years and continues to soar.

Electronic marketplaces in the form of on-line platforms are becoming increasingly important. An app can connect a supplier in one country with a consumer in another country, while the app provider's business headquarters are in a third country (preferably in a tax haven!) Goods are being transformed into services. Formerly, goods were sold (e. g. a radiology unit for use in a hospital), now holistic solutions are being offered as a service. In our example, the device manufacturer can provide imaging-related diagnostic services from remote locations or even from a foreign country using the equipment the company has installed and which is operated via the Internet. A lot of the aforesaid technologically defined phenomena in the new world of digital capitalism are steadily deteriorating into a regulatory "Wild West", and calls for new rules to sort out the ostensible chaos are becoming louder.

And this is where trade policies come into play. Trade policy, however, is not about regulations per se. From the aspect of trade policy – and of trade diplomats, most of whom are economic liberals and trade politicians – the main objective is to promote cross-border trading and break down any regulation that hampers trade or distorts trade conditions. Where trade policies have started dealing with the Internet,

the focus has been solely on commercial issues, mostly in the sense of contractually-defined market access for goods being offered on-line and across borders.

Especially the major economic powers are fighting for liberalisation of on-line digital data trading and traffic in the interest of their high-tech corporations and/or are attempting to safeguard this liberalisation through binding contracts governed by international law. Their demands include further liberalisation of market access by foreign electronic service providers, equal treatment of electronic and non-electronic goods, unhindered (free) data traffic, i. e. even for sensitive personal health data, financial data and other data, no obligation to store data solely on servers located in the data's country of origin, restriction of national options to regulate future services and limit the market access of such services, and no obligation of on-line service providers to maintain offices in the countries where the services are offered.

The major industrial nations are faced by many other countries, in particular developing countries, which are not prepared to negotiate these issues. These opposing countries believe that it is too early at least for contractually agreed liberalisation of on-line trading and data traffic in conjunction with sanctions for contract violations, and that this is not in the interest of their own development since it would only consolidate the current global digital divide. Electronic commerce may open up hitherto unknown international opportunities for niche providers in such countries, but only if the required infrastructural conditions (such as fast Internet access) are in place and the goods and services being offered really are competitive on an international scale. Especially where the latter is not true, indicators tend to point in the opposite direction: Premature opening of the market to international on-line providers exposes sections of the local economy to greater global competition pressure. Premature establishment of digital free

trade on the basis of the current status quo would perpetuate the technological lead of the countries currently leading the IT sector and make it difficult or even impossible for less-developed countries to catch them up. Prohibition of digital industrialisation instruments under international law would constitute unacceptable restriction of the freedom required for digital development strategies. Imposing new trade regulations such as non-discrimination or technology-neutrality could also potentially impede or even prevent efforts to subject the new platform providers to national legislation.

Quite apart from the complicated trade-policy topics, a certain amount of fundamental issues are involved here, too. Actually, this controversy merely reflects the classical lines of conflict that are being clearly redrawn particularly by the digitalisation of commerce: market versus the state and globalisation versus national sovereignty. On the one hand, the Internet businesses currently dominating the market demand that they should be allowed to operate their business virtually unhindered all around the world, or should only be subjected to minimal regulations in this respect, and that this freedom should be ensured by contract. On the other hand, in the interest of their own citizens, employees and enterprises, states have the right (or should we say "the obligation") to introduce "discriminating" rules for dominant foreign providers. This especially applies in our present era of great technological upheaval, when many states are faced with totally unequal starting conditions and see no advantages from allowing unrestricted international competition.

8. Digital enlightenment

We must not turn a blind eye to technological innovations, but it is also important that we do not ban any discussions and thought on how to advance the social potential of technology and on the conditions required to achieve this. Progressive parties, in particular, should have

fewer reservations about technology and give more thought to its social dimension: How is digitalisation changing the world of work? What makes a digital society vulnerable? How can we use digital technology to promote participation? How can we become responsible, politically mature citizens on and with the Internet? Who is going to lay down the rules in future? What objectives should digitalisation serve to achieve? Who is going to gain or lose power due to digitalisation? How can this technology be used to solve the major challenges facing mankind?

In other words, what we desperately need is digital enlightenment. This doesn't just mean that we need more transparent information about what is going on in technology and society, it also means that people must be empowered to participate in shaping future developments. To achieve this, we need better education in the digital sector – education that also promotes more general skills: How and where do I find the information I need? How do I assess this information? How can I protect myself against fake news? How should I handle social platforms? How should I use digital resources? How can I ensure that I am in control of the devices, instead of them being in control of me? All this calls for fundamental skills such as the ability to think critically.

High-quality education for all is also one of the core targets of Agenda 2030. Digitalisation accelerates the generation and dissemination of information, as well as global learning processes. On the one hand, this offers considerable opportunities for solving the main problems facing mankind and for providing everyone, especially people in developing and emerging countries, with access to knowledge, education and training. On the other hand, there is an increasing danger of manipulation and selective interpretation of facts. The ability to handle digital media responsibly will be one of the key qualifications of the future.

Digital citizenship education or code literacy, i. e. a basic understanding of what computers, networks and algorithms are all about, is also important if people are to regain their supremacy over technology. At present, the web community consists first and foremost not of self-confident decision-makers, but of "digital consumers". What we also need, apart from statutory regulations and transparency, is more personal responsibility and confidence in dealing with machines. The loss of individual autonomy is not unavoidable – a responsible digital future is still possible. For this to succeed, open and participatory types of technology, public discourse, digital enlightenment and emancipation are needed. The fact that "machine capitalism" is not always popular is not the fault of the machines. Therefore, the debate must no longer be confined to groups of experts in government, business and technology, but must be transported into the centre of society, for this is where it belongs. The blueprint for this world must be visible to all. To ensure this, more spaces where socio-political concepts can mingle with the technological "garage workshop" mentality must be created, places where technology is developed to meet people's needs and where the focus is on utility aspects. This is the only way for us to become "shapers" of the technological revolution rather than "drifters" and onlookers.