

Society – Technology – People

Theory-Interviews on the relationship between societal and technological change.

Interview with Prof. Dr. Sabine Pfeiffer

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1 Where do we find sources for technological change and social division of labour?

2 Mankind is the primary driver or, if you wish, the cause of all technological change. Human work lies
3 behind every technological development. It is not just a question of a creative idea, which was born
4 somewhere or other, and is not just the brainchild of a single person of genius, as we popularly like
5 to believe. People work collectively to achieve a thing together. And achieving such things actually
6 always involves work. To this extent, people themselves are always the driver. Individuals, and
7 people acting as a collective. Social development is therefore always the force behind technological
8 development. Technology is thus not an exogenous natural occurrence which is thrust upon us.
9 Humans are always the cause. They determine what prevails in society, the speed at which this
10 happens, the ensuing consequences and the precise technology design that finally emerges. This is
11 also ultimately a result of social relationships—the market, society, institutions, power and authority
12 relations. “Who has the power to implement things?” Unfortunately, this does not simply mean that
13 better technology always prevails. This, of course, would also bring up the question: “What is better
14 technology? For whom is what better and under which circumstances?” At the end of the day, these
15 are all a social issues. We often forget this within the discourse. We mostly act as if technology is a
16 development that matures up to a certain point and then happens, so to speak. The other
17 interpretation is that a genius comes along with a brilliant idea. Neither of these has ever been true.
18 Firstly, of course, any technological development always needs a large number of people in order to
19 be implemented. Secondly, developments always have historical foundations. This means that in
20 each case there have been generations and people before who have carried out prior developments
21 and work and have made decisions. Technology which previously, for whatever reasons, has won
22 through or not. All of this has a part to play, and this is why this whole related discussion is being
23 conducted, with a wave of technological developments seemingly washing over us, almost like a
24 force of nature. The only thing that we humans could do would be to deal with the consequences in

25 some way. This actually turns the problem upside down so that we have to correct it again. Social
26 developments, processes and relationships are always behind this. And the core of everything, the
27 core of development and ideas is human work. In terms of making the world an ideal place, so to
28 speak, it would be conducive only to promote technology which delivers a use value for society and
29 people, which enables problematic things to be solved and things to be done better, and so forth. In
30 other words, an approach which is purely aligned to providing use value. However, the history of
31 technology tells us that this is unfortunately no easy matter. Firstly, something which is
32 advantageous and positive for one person or vested interest group may possibly not offer the same
33 degree of benefit to other people or groups. This means, of course, that types of effect and
34 assessments may be quite different. But this could be an object of negotiation. The other thing is that
35 considerable dynamism is involved. This is not played out between technology and individuals or
36 between technological and social dynamics. Markets are ultimately crucial in this regard, and the
37 pertinent questions are: "What becomes of those who have assertiveness capacities on the market?"
38 and "What is perceived as being particularly profitable?" And, if the focus is once again on consumer
39 products, the decisions taken may be different from those made if we were to be looking at the
40 deployment of technology in the world of work, automation and so on. Unfortunately, the only
41 actual area of assertiveness currently is the market. The market may be a good establishing force,
42 but if it becomes the sole mode, which can currently be observed with regard to some technologies,
43 society is then unable to keep pace. This is another debate that is presently ongoing. In effect,
44 infrastructural conditions are being created which will also make it very difficult for society to look
45 back and say that something is not the preferred option or that we would like, for example, to
46 mitigate the consequences. This means that a strong sense of dynamism exists at the moment,
47 particularly across the market dimensions which drive the implementation of technology. #00:05:28-
48 4#

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50 **Who is driving technological change and social division of labour?**

51 In terms of where we stand today, I think that we would have to say that the question of how we
52 shape technology, such as for example within the work process, is automatically linked with decisions
53 regarding forms of division of labour. And where we are not aware of this in shaping technology,
54 possibly unintentionally, decisions are made about the worlds of work of other people, perhaps on
55 other continents or in other cultures, without reflection. This is a problem and may be primarily be a
56 problem with the technologies that we are dealing with at the moment. Of course, these occur in a
57 way that is relatively detached from local contexts and from certain traditionally established forms of
58 division of labour. They are, however, at least associated with a type of division of labour. I believe
59 that we should not underestimate this. Technology is something social. It arises from social relations.
60 The question as to what prevails and what does not is also an issue of social and power relations. But,
61 of course, technology is not merely a social construct. Once in place, it suggests certain procedures
62 whilst making other procedures impossible. If it is of an infrastructural nature, it sets out pathways
63 from which it is difficult to depart. So, once a technology is in existence, it will set parameters. For
64 this precise reason it is extremely important to observe the interplay between the materiality of
65 technology. Even in virtual technology, this is not random. I believe that the theoretical debate in
66 sociology has, for example, long been guilty of a misinterpretation for thinking that virtual
67 technology is arbitrary technology, i.e. technology that can be arbitrarily shaped. Such statements

68 can also be read in theoretical essays from the 1990s on areas such as digital technology. Because
69 this only consists of the values of zero and one on a certain level, the view was that it could be freely
70 used to tackle anything at all – other than a massive machine. Of course, this is true in an abstract
71 sense. But when the code has been written and the software has been compiled, I can only use them
72 for particular things and no longer for other purposes. Certain procedures are at least suggested to
73 me, and other courses of action are rendered more difficult or made totally inaccessible. And so the
74 question of what will be shaped and how it is translated to workplaces or the life world is
75 momentous. This is why the question of what this has got to do with division of labour should be
76 asked very early in the development of technologies, but sadly it is not. Regrettably, the predominant
77 approach is that we develop technology in an area, also for the world of work, where the people who
78 develop these technologies have relatively little idea of what is going on. Those who will
79 subsequently be affected have no opportunity to say what they actually need in their workplace.
80 There are thus no real and democratic forms of employee participation in an early phase of
81 technological development. This is possibly something which is historically, what we have to develop
82 now in order to arrive at methods which will enable us to intervene given the speed, or perceived
83 speed. Looking at the processes we have thus far, technology impact assessment and the like, which
84 is mostly used in technologies which have an ethical element or are at least viewed critically (gene
85 technology, nano technology etc.), they have perhaps too high a ceiling, are too tough and too
86 demanding. But, in the case of this technology backlash which may arrive relatively quickly in our
87 everyday lives and working routines, we actually lack the societal mechanisms which would enable us
88 to intervene effectively and early and above all via a discourse involving many people. This is another
89 possible reason why society is constantly confronted with this feeling that these things are simply
90 coming over us but that things do not need to be this way. What's happening right now is just
91 dramatic, I think, and you can see this in discussions about robotics, and, what's possibly even more
92 dramatic is in anything related to so-called artificial intelligence, deep learning and so forth.
93 Discourse has become super-elevated with regard to the effectiveness and abilities of technologies,
94 and this is accompanied by an unbelievable devaluation of what humans are able to do. Images shift
95 within the debate, and both views are unjustified. Artificial intelligence is not intelligent. The
96 machine algorithm which is able to differentiate between pictures of cats and pictures of dogs still
97 does not know what a cat is and what a dog is. But the discourse attributes this ability as if this
98 technology were capable of something and could perform a different task tomorrow. Deep learning
99 technology which has learned to differentiate in this way cannot do other things. But as long as we
100 super-elevate to this degree and do not look precisely, what can these new technologies do? They
101 really can perform a few things better and differently to their predecessor technologies. There are
102 great opportunities, but we also need to talk about where they can be usefully deployed. But we
103 cannot discuss this sensibly as long as such an artificial super elevation exists. Interestingly, this does
104 not frequently tend to be introduced by the technology developers, i.e. those who are at the
105 forefront. They frequently lean towards scepticism, although not always, and are prepared to talk
106 about the limitations of what they do. It tends to be other stakeholders who push this discourse. I
107 believe it is permissible and justifiable to ask about the vested interests that are at play when people
108 talk up technology and talk down people. One specific example of an area where lots of robotics are
109 in place is, of course, the automobile construction sector. When discussions about car building take
110 place, and the debate that occurs in the sector itself is sometimes of a different nature, the media
111 frequently present the same argument, namely if a robot or AI is used in predictive maintenance, for
112 example, fewer errors will be made than by a human. Yet this is a branch in which a zero error rate
113 has been an object of discussion for 30 years, and for about 30 years, all kinds of conceivable and

114 viable technical, organisational and competence development measures have been undertaken in
115 order to minimise the number of mistakes. This is, of course, done for purely economic reasons, but
116 there has been quite a good level of success. There is probably no other sector in which such an
117 approach has been pursued so systematically and effectively. And yet, at the same time, there is
118 constant talk of how humans are so very error-prone. And now it would be so great to have
119 technology which makes fewer mistakes than humans, - which actually still had to be proven and in
120 many cases is not true. We can already see that the question of what is really happening is a highly
121 complex one. Many aspects are involved, and I believe that we need to consider things very carefully.
122 Are we actually now speaking of a specific application where an assessment needs to be made of a
123 specific technological setting in a particular form of labour organisation with a person who has, or
124 does not have, certain competences and qualifications? Or are we talking about which images are
125 transported in such a setting? In the latter case, the question needs to be posed as to which
126 stakeholders are behind it all. Sometimes it might just be media dynamics operating, but this is the
127 way in which the media function nowadays. Of course, this is a contributing factor. People like to
128 dramatise, but I believe that this is a dramatic development. On the one hand, it makes it extremely
129 difficult for us to speak seriously about the things which are possible and also about things which
130 may not yet be possible. We can only help to shape developments if we have the right information.
131 On the other hand, the discourse involves a permanent devaluation, especially of certain tasks and of
132 certain people who are behind these activities and perform them every day. Continuing consciously
133 to relate my remarks to the manufacturing sector, these are tasks which are still extremely
134 macroeconomically important to our country in terms of value creation. Not all that long ago, they
135 enjoyed a relatively good and recognised status. Over the course of recent years, the technology
136 discourse has played a major role, albeit not alone, in bringing about creeping devaluation. In the
137 discourse, production workers at the nation's car companies are increasingly being sold to us as
138 people who carry out very simple, monotonous, boring and undemanding work. This is not true, but
139 the people who perform this work are now able to read in the newspapers on a daily basis that the
140 work they do is not particularly challenging and is constantly associated with errors at the same time.
141 This also has an effect on people. When we are seeking out protagonists, I believe that it is
142 worthwhile to look at who is actually fuelling which images and why latent strategies are in place. Is
143 the intention to foster certain forms of technology use and to do without human deployment in
144 future, for example qualified skilled workers? The discourse certainly sometimes gives rise to the
145 impression that such strategies are behind it all. With regard to research, I think it would be worth
146 having a closer look at who transplants which images. Is the process being driven by strategies, or is
147 it simply a case of medial mechanisms which escalate at some point and develop dynamics of their
148 own which no one wished to have. Something like this can certainly occur too. #00:16:48-1#

149

150 **Which consequences will arise from technological change?**

151 I continue to believe that Germany's labour force structure has maintained a strong centre over
152 recent years, and indeed many labour market analyses support this view. This is certainly a key factor
153 in Germany's significance as an economic zone. After all, it is not a terribly large country, and the
154 question of why we have attained such economic importance may sometimes be posed. Germany
155 offers an innovative model with an emphasis on small and medium-sized companies and a strong
156 focus on sectors such as engineering. It is, however, a very specific model. Nevertheless, it is also

157 extremely successful. Of course, the roots of this lie in the labour force structure. By the same token,
158 this structure also reacts to requirements. There is, of course, a context of reciprocity. If we permit it
159 to happen, this centre will actually be eroded in a non-organic way because we allow a certain
160 technology model and do not have the assurance to take control. But our model has different
161 strengths. It is perhaps also the case that it would be clever to have different national economies
162 with different strengths within the context of a global division of labour. They may then be able to
163 act in a complementary, reciprocal and stimulate one another in a conventional economic way. This
164 is instead of a situation where everyone feels they need to move in the same direction. This is
165 revealed in a stronger binary division in the companies. On the one hand, we have the decision
166 making level. On the other, there is a desire to arrive in the world of Industry 4.0 in terms of work
167 organisation and with regard to the logic of division of labour. Ultimately, however, there is a
168 regression to a 1.0 Taylorism model. We thought we had overcome this in the 80s/90s, and indeed
169 there are many reasons why we ought to move past it. Otherwise, we would not have gained
170 anything at all. In fact, we would have lost a whole lot and would further exacerbate the trends
171 which are already apparent. Social inequality both globally and in this country has become
172 increasingly stark in recent years. In the long term, this cannot be a model for democratic societies.
173 Participation of a democratic nature must also be reflected economically in some way. I believe that
174 this is becoming visible at more and more points. We need to undertake a serious consideration of
175 matters which are closely related to technological development, also focusing on which stakeholders
176 decide which forms of technology are used in which processes and how they are deployed.
177 Everything which arrives on the market has an exchange value and a utility value. The utility value is
178 something which is genuinely qualitative. It can only be made indirectly measurable. This means that
179 someone somewhere is putting things to some kind of effective use. The other aspect is the
180 exchange value. This is connected with how much work has been put in and where. There are also a
181 few add-ons, such as whether a monopoly position is held on the market. We have perhaps lost a
182 little of our ability to recognise true utility value. Of course, we may have been persuaded of the
183 value of many of the things we use via advertising, and this value may not be present at all. It is not
184 always easy for us to perceive other forms of utility value, such as an ecologically functioning
185 environment. Most people are slowly starting to notice that there are fewer birds and insects in our
186 country than was the case in our childhood. This message is, I believe, gradually getting through in a
187 tangible way. But we find it more difficult to accept the theoretical premise that reductions in certain
188 aspects of biodiversity are connected with our own lives. One reason for this is that we know we are
189 not responsible as individual people for causing this. It has been brought about by mass effects and
190 structures, and we were not asked whether we wished to have these. The question as to what
191 actually constitutes utility value, i.e. what is the qualitative value of things, processes or outcomes, is
192 an issue which would help us in many ways if we were able to engage in more detailed discussion
193 once more. This is something which is really required. Because many things, which are now being
194 developed, are not needed. Let us take an example. The platform economy has provided us with
195 many vehicle sharing models which are placed everywhere. There is an unbelievable number of start-
196 ups all over the world offering bicycles, electro mobility and e-scooter schemes in the hope that
197 people will hire such vehicles. This does not make very good economic sense and only works because
198 venture capitalists are able to wait for a few years before they have to make profits. Ecologically, of
199 course, it is madness. The platform economy is bringing about change. On the labour side, crowd
200 working is changing things too because, for example, the form of contract is completely different.
201 People can become self-employed on a solo basis. The new technology is also altering labour
202 capacity, something which I refer to as the utility value aspect of work. This is the sum total of

203 experience I have gained in life, including physical capacity, equipment, educational processes and so
204 forth. Everything that I possess in this regard and which cannot be taken away from me easily. I can
205 make productive use of this labour capacity in some form or another at every stage of working life.
206 Where is this impaired or affected? In other words, is something changing? Can I apply more of my
207 labour capacity in my workplace? Or is technology changing the job to such an extent that I am only
208 able to use a smaller part of my labour capacity? This automatically means that my development
209 opportunities will diminish, at least in the workplace. I find that these categories are also extremely
210 helpful as empirical categories, because they disclose a little more and are more separable in an
211 analytical sense: In which area does which form of technology take effect? I can then evaluate this
212 and assess the consequences by carrying out an empirical study. I started by untwining that it makes
213 a difference if I am impacted by change on my exchange value or formalised side, if my labour
214 capacity is affected or if both are influenced. The direction and extent are then an empirical question.
215 It can be seen that the new digital technologies are exerting a particularly strong force on this
216 determining factor in an attempt to enlarge the proportion of exchange value. If we now think of
217 “wearables”, for example. These are technologies which I carry on my body during the work process.
218 Suddenly, they make my vital signs recordable. My employer can see when I become tired or if I only
219 become tired at certain times and certain days of the week. Something which actually entirely
220 belongs to me, my body, is then brought over on to the exchange value side because it has been
221 made measurable. Indeed, my employer possibly knows more about my body than I do. It has been
222 made assessable. #00:25:21-3#

223

224 **How are drivers and consequences of technological change connected?**

225 There are definitely inhibiting factors. Firstly, I believe that there are inhibiting factors in the
226 technology itself. Technology which was possibly launched onto the market too quickly may, of
227 course, be unstable. It may also not deliver what it promised and contain inherent risks. The larger
228 and more networked technologies are, the greater will be the potential risks associated with them.
229 This is another area where we need to rethink. We always have the notion that so-called major
230 technologies are very risky. Nuclear energy is a case in point. If something happens, it is clear that the
231 consequences will be huge and dramatic. Aviation is an area in which certain safety measures need
232 to be visibly in place. The implication of not doing so is loss of human life. That other technologies
233 which, although they seem to be of an everyday nature, can suddenly attain an unprecedented level
234 of networking and become major technologies in their own right, with similarly large risks connected
235 to them. This is something which we are only just beginning to grasp. We do not, however, have the
236 mechanisms in place to deal with the situation. The great danger, and something which may also be
237 an inhibiting factor, is if action comes too late and perhaps even at the cost of human lives. If the
238 inhibiting factor is that certain technologies run the risk of running into a brick wall, then there will,
239 of course, always be people who are affected in one way or another. This is actually the worst type of
240 inhibiting factor. I would say that other inhibiting factors are diminishing a little at the moment. This
241 is also connected with the fact that conventional market mechanisms are somewhat eroded at the
242 moment. The situation we have currently is not actually closely related to technological
243 development, although we often perceive such a connection. Certain new digital business models
244 have been able to emancipate themselves from traditional market mechanisms because they are
245 backed by so much venture capital. This means that they can afford not to make a profit for a period

246 of years. This means we can take everything which we have previously understood as inhibitive in
247 terms of the logic of entirely traditional market economics and say “Okay, perhaps other competitors
248 will emerge offering better technology or the same technology at a lower price.”, and competition
249 and the normal notions of how markets function will be restored. We no longer have this at the
250 moment, at least with regard to certain digital models and especially in the platform economy, which
251 is not terribly innovative technically. Their innovation comes more in the form of a business model
252 which says: “I will manage to gather so much money that the question of when I will need to make a
253 stable profit will not arise for several years.” This will, of course, enable me to establish a market
254 dominance that can no longer be stopped. “Yes, but the technology is not yet fully developed. The
255 business model does not fit all local markets.” It is clear that there are many distortions. All the
256 platform economy models are certainly arriving in national markets, but are also becoming aware of
257 a few inhibiting factors. But market dominance is so strong that even the conventional mechanisms,
258 which are able to slow things down or possibly ensure that only better technologies become
259 established, have been eroded—at least in theory. Certain technological developments or business
260 models which seem to be based on technological development currently have few opportunities to
261 use market conditions to counter this. At least there is very little chance of reducing speed to a level
262 which will enable markets and societies to be taken along and of gaining any understanding of
263 certain new adjustments that may be necessary at certain points and that need to be tackled via a
264 discursive approach. From my point of view, this is the really dramatic development that is occurring
265 at the moment. We can no longer rely on the market in the classical sense. In certain areas, the
266 market is certainly acting as an inhibiting factor rather than emerging as a pushing agent. #00:30:29-
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268

269 **What measures can be taken to steer technological change?**

270 My thesis is, for example, is that managers may be affected to a very much stronger extent than is
271 being discussed at the moment. We may possibly be dealing with large numbers of unemployed
272 managers in a few years’ time. What would we do with them? Surely it would be sensible to send out
273 a signal to reassure them that they will not end up on long-term welfare benefits twelve months
274 later. To tell them that it is not their fault and that we stand behind them as a society. We are going
275 through a major historic process. This affects us all and may hit certain groups of work harder during
276 certain phases. But it is up to us as a society to say that the risks which may emerge at particular
277 points should not have a disproportionate impact on individual groups. In a democratic society, we
278 should have all the leverage to think up measures. We should also be able to say that although we do
279 not yet have any idea of the precise nature of these measures, because we cannot say who will be
280 really affected and how, we could, however, make a collective declaration of intent and instigate this
281 at a policy level. We could say, you will not be left to fend for yourselves when this point is reached.
282 We are not prepared to accept that a development which may be more disruptive will inevitably
283 produce losers. This is a moment in the discourse from which I gain the impression that the effect
284 will be stronger if it is disruptive. The acceptance that there will be losers fits in nicely with
285 Schumpeter’s concept of creative destruction. But I do not think that this is something which we can
286 afford to let happen. It is not right that disproportionate damage is done to certain groups of people,
287 social structures or ecological resources. This should not be permitted, and I believe herein lies the
288 real challenge. I am constantly asking myself why we are always looking at where we can replace

289 people with robots or AI. If AI is so clever, why do we not ask it to look at the question of how we can
290 continue to manufacture all the many smart phones everyone obviously wants to have without using
291 up rare earths. We will then have no rare earths in the future, when they may be urgently required
292 for another purpose. There are many useful areas of deployment for new technologies. It is,
293 however, a pity if our discussion only centres on where they can be used instead of people. If aliens
294 were to arrive on this planet in a hundred or five hundred years' time, I sometimes wonder whether
295 they would ask us: "Why has your species used up such a tremendous amount of resources, energy
296 and intelligence in duplicating yourselves technically?" This is what the discourse is currently telling
297 us. Artificial intelligence is cleverer than we are, and robots are quicker and more precise. At some
298 point, both of these together will ultimately lead to a situation where we are no longer required. This
299 really is a strange decision. We have all kinds of shortages, but there is certainly no lack of people.
300 Actually, quite the contrary is the case. Our planet is home to a huge number of inhabitants. It is
301 totally nonsensical to seek to replace the one thing we have such a surplus of, even if it is not good
302 for our planet that there are so many of us. There are so many other things that humans are really
303 not good at doing. These are areas in which we could make more sensible use of technologies. I think
304 the discussion should centre on finding a useful division of labour between technology and humans
305 rather than on the sort of labour division to which technology may lead. We should also be much
306 more creative and innovative and perhaps also a little more critical in our reflections and debate than
307 we are at present.

