

Society – Technology – People

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

Interview with Prof. Dr. Martina Heßler

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

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3 I would like to start by saying that I would not speak of drivers. Driver seems to me to be
4 a term which is closely related to economics, which I believe also became fashionable
5 alongside computerisation. Interdisciplinary technical research in particular has
6 developed multifarious approaches. This indicates that this suggestion, which is linked to
7 the drivers, and the associated notion that determinable stakeholders are responsible for
8 development is not complex enough. Our interlinked structures are too complicated to
9 enable one driver to be identified specifically, because there are very many approaches
10 in interdisciplinary technical research. My approach, however, would be to move beyond
11 all these approaches which already exist into historical technology anthropology, and
12 here I am speaking more of conditions than of drivers. This historical technology
13 anthropology means that we need to look into the issue of the position of humans in an
14 engineered world, the issue of the changing relationship between people and machines
15 and the issue of the human image. It is actually quite apparent, both historically and
16 currently, that these human conceptions, the way in which people see themselves and
17 the relationship they develop with technology, is a clear condition that co-determines
18 technological development.

19 My perspective is historical and anthropological. Therefore, my focus with regard to this
20 issue is on the relationship between humans and machines. Of course, we also need to
21 say that the societal division of labour is between people and machines, which, naturally,
22 is stratified by social groups and skills characteristics. But my actual interest is the
23 relationship between humans and machines, and here I would say that these very
24 human images are a co-determining factor alongside technological development, the
25 relationship between humans and machines and the societal division of labour. If you
26 have engineers, they will of course have a certain human image. This is often implicit,
27 but they design technology with certain human images in mind. Interaction between

28 humans and machines needs to be developed, and human images are very relevant in
29 this regard. Users of technology also develop a certain internal self-image. For example,
30 they may control the technology. This then affects acceptance, use and also the long-
31 term and medium-term development of technology.

32 So I certainly believe that we have a process, which is running in a more accelerated
33 way than in the industrial revolution or even during the 1970s and 1980s. These
34 developments are indeed impressive. Take for example the translation programmes,
35 which were an object of ridicule for a long period. Today, they still have a long way to go
36 before they are able to compete with good, professional, human translators, but fantastic
37 progress has been made in a relatively short period. So that they are now massively
38 used, as a template. So I believe, that an acceleration is taking place already.
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42 Who is driving technological change and social division of labour?

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44 I think that anthropocentrism, in other words the notion that people are the actual
45 controllers, shapers and users of technology and of the whole of the engineered world,
46 is still very dominant and potent. This will remain the case and will determine the
47 discourse very strongly. And this area is actually where I see a major problem, because
48 it does not correspond to what we are experiencing and to what is happening at a
49 practical level. Essentially, we need to reflect more closely on the fact that this formative
50 position adopted by humans is not as commanding as people assume.

51 I think that major changes will occur because machines are now able to issue
52 instructions. Before, we used to have card indexes and so forth, but now machines pass
53 on instructions to people. We are essentially experiencing a tendency towards a neo-
54 cybernetic system, in which people are a component within a work process and they are
55 very closely linked with machines, resources, materials etc. and need to function via
56 information in this system. #00:04:46-6#

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59 Which consequences will arise from technological change?

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61 Work has been a self-evident part of a work society for centuries. Such an identity is
62 under threat if people perceive a risk that machines will perform their work, and I believe
63 that this point is highly relevant to the technology development and societal division of
64 labour. The focus is not always on replacement, but also on the redistribution of the
65 division of labour. Therefore, machines take over tasks, but rather than replacing people,
66 they create a new sort of interplay between humans and machines.

67 Decision-making is one question, which I believe is new. Artificial intelligence systems
68 make decisions, which in some cases people are unable to understand. We have expert
69 systems, which can process huge quantities of data, thus extending far beyond human
70 capabilities. This provides the basis for the decision and people have no comprehension
71 of how such a decision came about. This leads to a debate, which has been ongoing
72 since as long ago as the 1950s, for example, when autopilot systems in aeroplanes

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73 were one of the subjects under discussion: What actually happens if people lose these
74 abilities? Of course, we forget all the skills if we do not perform them ourselves. There
75 will then also be a shift in competences and in the tasks, people are able to carry
76 themselves. At the moment, I think that reliance on machines is becoming much greater,
77 and people will become much more dependent on cooperation with machines.

78 This means that working bodies, human bodies, will also change and human practices in
79 the world of work will alter too. Another aspect that is very important to me is the self-
80 perception of the respective workers, in which they see themselves and their
81 understanding of the position they have in the work process.

82 And I believe that the question as to what is useful is also a highly controversial one.
83 Nevertheless, it is a question, which needs to be posed and precisely within such a
84 process of negotiation, I believe that things will need to be clarified or attempts will need
85 to be made to arrive at an arrangement. In this case too, interdisciplinary technical
86 research has clearly revealed that structural processes are highly complex. This was
87 emphasized since the 1980s: no technological determinism. But we rather can and we
88 must design and shape things! Nevertheless, the result of this design is seldom in line
89 with intentions. This is precisely because the processes are so complex and involve so
90 many stakeholders. For example, younger voices such as Peter Haff, who introduced
91 the term technosphere, have said that we can basically develop things at a local level, in
92 other words once again at the company level. But no steering or control opportunities
93 now exist at more complex or at system levels. Because of the many different
94 components within the system, something is happening which can no longer be
95 controlled in any way by individual stakeholder groups. This means that things need to
96 be shaped at the local operational level. This is, however, also dependent on significant
97 correlations. So the question of design and development is a highly complex and difficult
98 one. But it is one which needs to be tackled. I think the point is that we always need to
99 be aware, that design and development will not lead to the intended outcomes,
100 especially in the medium and long term. I believe that individual groups bear great
101 responsibility or great potential responsibility with regard to what they need to consider
102 and reflect upon when innovations are introduced.

103 Central to all of this, in my view, is one point, which is insufficiently addressed within the
104 context of digitalisation: The question of resources and climate change. Because
105 especially digitalisation consumes an unbelievable amount of energy and resources, an
106 issue which is completely underestimated and absent from the debate. Both in our
107 personal lives and at companies. The consequences are that new technology and new
108 energy and resources consumption are created whilst the climate debate continues to
109 be conducted independently. Basically, these discourses need to be merged. So here
110 we perhaps have negative consequences that should be taken into account: the
111 environment, climate and use of resources. There can also be negative consequences
112 and I believe there are some, which we can historically see in every transformation.
113 Even if a transformation is not disruptive, there are always losers. I am absolutely sure
114 that the same will happen this time too. There will be people who cannot keep up,

115 people who will be unwilling or unable to go along with such continuing training and
116 learning processes. This is certainly one of the negative outcomes of transformation
117 processes of this kind. Positive implications can, of course, also occur. We have lots of
118 positive consequences when digitalisation is deployed in medicine, when expert systems
119 can detect diseases and so forth. Strictly speaking, you have to answer specifically this
120 question in many empirical examples and you have to take a closer look at what is
121 happening.

122 So I would point to the question of resources and energy consumption caused by
123 digitalisation, and of course the issues of data security and use of data are now also
124 very obvious. But I believe these matters are being discussed, even if we are a long way
125 from finding a solution. Nevertheless, the issue of resources and energy consumption is
126 in my opinion being completely underestimated within the context of digitalisation.
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130 **How are drivers and consequences of technological change connected?**

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132 For historians, the term mechanisms perhaps presents similar difficulties to those posed
133 by the term drivers. This is because it has its basis in a concept of causality, i.e. the
134 ability to allocate clear mechanisms. The actual current tendency of historians is to look
135 at the question of how rather than why. From my historical and anthropological
136 perspective, I would not speak of mechanisms. Perhaps I would answer the question by
137 saying that the historical and anthropological perspective certainly presents us with
138 different basic issues and problem areas. These have been a constant object of
139 discussion of industrialisation since the early modern era, and issues relate to matters
140 such as: what position do humans have in a highly technologized world? How are
141 people respectively defined, particularly with regard to technology? Do they see
142 themselves as a cyborg or as a competitor to technology? An operator or a technical
143 being? These are questions which have been constant objects of discussion historically,
144 and they remain virulent issues in the present day.

145 The second important point is, I feel, that the discourse is presently too closely focused
146 on digitalisation and on AI, in a very one-dimensional way. We basically also need to
147 look at the interplay between various technologies, i.e. the neurosciences, gene
148 technology, infrastructure and mobility and communication technologies. All of these
149 play a major role in the world of work, at least infrastructure and mobility and
150 communication technologies and possibly also genetics and the neurosciences. I think
151 one of the greatest challenges is simply to think about all of these together. What
152 happens when we achieve breakthroughs, developments and further developments in
153 different fields and when people need to reposition themselves and are faced with
154 entirely new challenges and responsibility? This is an important point, I believe. Thinking
155 about these things collectively.

156 There is an apt quotation from Käte Meyer-Drawe, which I always like to mention. She
157 says that people are reflected in their machines and try to solve their puzzle by engaging
158 with machines – or by identifying with machines, there is considerable variance in this
159 regard. She applies this to the early modern era, and indeed I believe that it is a

160 question that has been posed since the time of Descartes.
161 Nevertheless, there are historical differences and shifts. Firstly, of course, we have
162 amalgamation. The term cyborg does not emerge until the second half of the 20th
163 century. And we have a whole new phenomenon in that people describe themselves as
164 technical beings. So this basic issue of the relationship between humans and machines
165 is always present, but there are nuances or considerable shifts in the way in which it is
166 perceived.

167 I believe that there are always path dependences. Solely because of infrastructures, and
168 we can see this in the case of digitalisation or non-existing infrastructures. At the same
169 time, path theory now also includes critical junctures where we can turn off, alternative
170 paths. I think that this entails more expenditure, more strength and more societal
171 engagement, but in principle I would not emphasise path dependence too strongly.

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174 What measures can be taken to steer technological change?

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176 The challenge, which I now see from my historical and anthropological perspective, is
177 that we need a new kind of anthropological reflection. This is not the first time such
178 discourses have been conducted. There was a brief but intensive anthropological
179 discussion around the year 2000, and I think that we need to carry this out again today.

180 The challenge is that we need to arrive at a societal understanding of the role that
181 people should play and of the role that should be played by machines. How much
182 decision making do we want to surrender to machines, where is this legitimate and
183 useful and in which areas is it not? I believe that it is somewhat problematic if
184 legitimisation has its basis in the fact that the person ultimately remains the decision
185 maker, because it is an illusion to say this, when machines make decisions and we are
186 no longer able to understand these decisions. So I actually think that the challenge lies
187 in renegotiating and redetermining the position of people. This does not just apply to
188 narrower technological developments. The debate also relates to the Anthropocene, and
189 I think that humans need to adopt a position that moves away from anthropocentrism,
190 but nevertheless still takes account of the responsibility of a being which manufactures
191 and produces more than any other entity on Earth, including technology.

192 My vision would actually be citizens' forums, in which such issues are discussed at a
193 broad societal level. This does not necessarily need to take place at companies, but they
194 could be held locally. There have often been discussion groups and citizens' forums in
195 the past, including within the context of gene technology and nanotechnology. Such
196 groups would operate under guidance, but a kind of "grass roots" movement emerging
197 from below could lead to a significant process of understanding regarding the issue of
198 the human image. I believe that they could make a major contribution towards at least
199 calling into question the anthropocentric illusion which many people still hold.