Technology, employment and work organisation
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I would like to say a few words on what I think is the elephant in the room in the debates on the impact of digital technologies on employment: work organisation.

1. <u>The unit of automation is tasks, not jobs.</u> In the majority of cases, jobs are not only bundles of tasks. There is a lot of uncertainty and indetermination in productive processes, and most workers are required to be able to deal with that uncertainty on top of the bundle of tasks that their job may entail. But even the most advanced forms of artificial intelligence and machine learning are narrow: they require well-defined problems and goals. Until the arrival of Artificial General Intelligence, which is still at the realm of science fiction rather than technological feasibility, machines will be confined to the performance of predefined tasks under human supervision. What this means is that, strictly speaking, all automation is complementary rather than substitutive of human labour: only for specific tasks we can talk about substitution or automation, never at the level of human labour in general terms.

2. <u>Work organisation is a key determinant of the automation of work.</u> The degree to which a particular job requires more or less competence, autonomy and sociability on the part of workers (all attributes of human labour which remain above current automation possibilities) ultimately depends on work organisation. Some forms of work organisation explicitly try to reduce the importance of those attributes, because that allows a more effective control of the production process and access to cheaper labour. They do this, ultimately, by reducing the job to a pure bundle of predefined tasks, removing as much as possible uncertainty and indeterminacy from the job. This implies a more detailed division of labour, the standardisation of tasks and processes and a centralisation of decision making. The typical example of this form of work organisation is Taylorism. Because of the reasons previously explained, these forms of work organisation facilitate the automation of tasks, even the automation of jobs if they consist of a simple collection of predefined tasks. For instance, the taylorisation of industrial processes preceded the automation of industrial process. So it is not only the technical nature of tasks and the existing technologies that determine the possibilities for automation, but the organisation of work.

3. <u>Digital technologies are already having a significant impact on work organisation.</u> Technologies do not only affect tasks and automation, but also the way work is organised. And digital technologies are already having [a very significant impact] in this sense, in at least two different ways. First, the [digitisation of production process] (using digital devices to generate, store and analyse big amounts of data on everything that happens in the workplace) allows not only the optimisation of processes, but also a much more detailed standardisation, control and

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[1] The views expressed in these notes are those of the author and do not necessarily reflect the position of the European Commission.

surveillance of work. Secondly, the use of algorithms for managerial purposes (with platform-based management systems) allows an extreme division of labour into tasks, and a very significant centralisation of decision making. In short, digital technologies allow the extension of neo-tayloristic forms of work organisation to economic sectors and activities that because of their nature were not possible to organise this way until now. And furthermore, this new forms of work organisation can overcome some of the traditional problems of taylorism, such as the rigidity it imposed in productive structures or its reliance on large-scale demand of undifferentiated goods. An extreme example of this digitally-enabled taylorism is some forms of work in the platform economy such as Uber or TaskRabbit.

4. Fewer routine jobs but more routine work? Perhaps a good illustration of the paradoxical effects digital technologies can have on work and employment is some work I did with Eurofound colleagues on change in tasks within and between jobs in the last 20 years. It is a well-known fact that jobs involving more routine tasks are secularly declining in developed economies in recent years, and it seems likely that this is related to the impact of digital technologies in work. The term for this is routine-biased technical change. But what is perhaps not so well-known is that simultaneously, the reported levels of routine at work are actually increasing within most jobs, especially those that were not very routine to begin with, such as professional and technical jobs in education, health or finance services. We studied this using simple reported levels of repetitiveness and standardisation on a number of variables in the European Working Conditions Survey. The increase in routine is statistically significant, and overall of a larger magnitude than the compositional decline in routine resulting from occupational change. It seems very likely that a significant contributor to this increase in repetitiveness and standardisation is precisely the same digital tools that help automating routine tasks. Computers both require and facilitate the standardisation of work processes.

5. But the impact of digital technologies on work organisation is still to be defined. Whereas automatization is a technical concept, change in work organisation has obvious social, political or even moral implications. Work organisation refers to the rules that govern social relations in the workplace, and historically these rules have been thoroughly discussed and regulated by democratic political systems. In recent history there have been other technological revolutions that have transformed the organisation of work and employment, triggering changes in the regulation of labour as a consequence. The effects on work organisation of digital tools require a similar debate, and an update of the regulatory framework of work and employment. In some aspects, the debate is already there: for instance, in the case of labour platforms and the need to redefine the concept of dependent employment. But the debate must extend to other aspects, such as the privacy rights of workers in digitised processes or the need for transparency in the algorithms that manage work processes. The results of this debate and its political outcomes will ultimately determine the impact of the digital revolution on work and employment.