

Macroergonomics considerations on the premises for sustainable technology transitions in Finland

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Abstract: Digitalization and the related rapid development of technologies are simultaneously an opportunity and a challenge. The technology-driven era we now live in is often referred to as Industry 4.0 that is seen as a continuum to earlier historical industrial revolutions and as a manifestation of the fourth industrial revolution dominated by information technologies. Within industrial revolutions, we have witnessed major steps in technological development, and at the same time, we have seen how the conditions and requirements for human work have changed. Now, in the era of this fourth revolution, businesses seem to be dominated by paradigms that emphasize profit-making above everything else. In this regard, scientific literature calls for approaches that allow us to understand more profoundly work as a sociotechnical construct. To facilitate discussion on the solutions leading to sustainable sociotechnical transformation processes, initiatives for human-centric futures have been proposed. For instance, the European Union (EU) has proposed a human-centric future industrial vision, Industry 5.0 that supplements Industry 4.0 with values promoting human and natural capital when seeking sustainable competitive advantage.

In the infancy of Industry 5.0, new policies, policy instruments, partnerships, and new objectives for policies affecting industries have been called by the EU. In this macroergonomics oriented presentation, we contribute to this discussion from the strategic management perspective, by observing the instruments nations have for following and steering their progress towards a human-centric future. We see here an ambitious role for the discipline of human factors and ergonomics (HF/E) that is interested in finding sustainable ways to optimize human well-being and system performance simultaneously. We pay special attention to Finland that seeks to increase competitiveness and well-being through digitalization and within better working life. Meeting this objective seems a complex challenge: there are many signs of negative development trends in the Finnish working life, and also evidence how our labor productivity has fallen behind the competitors. We must find ways to implement sociotechnical thinking on the general discussion on productivity and on understanding the combinations and interactions between the components of capital (K), labor (L), energy (E), materials (M), and service inputs (S). Further, we must pay attention to tangible and intangible capital combinations in this KLEMS context to understand the realities of productivity logic, where production factors and their interactions are changing fast. In this presentation, we acknowledge the well-known strategic management paradigm 'that you cannot manage a thing that you cannot measure', and we ask how the developments in productivity and well-being are currently measured in this context at a national level. We see that the empirical measures in this context should be modernized, which is also emphasized in new Industry 5.0 visions by the EU. There is an evident (and rapid) need for future research to search and develop more appropriate measures that reflect the contemporary economics thinking that values profoundly human and natural capital more than done before.