Chapter 17
ICT Tools and Transform in Work: From Computer Supported Work to Knowledge Work

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ABSTRACT

In this chapter, we consider ICT (information and communication technologies) as a tool that has significantly changed our work. We deal with the relationship between work and ICT, and changes in work due to the development of ICT, and their relationship with worker well-being and stress. Our aim is to consider major trends in research starting from studies about office work and computers and ending up to the use of ICT in knowledge work. We cover mainly a period from 1970’s to the end of 2000’s. Our main interest is on various types of information and knowledge processing work where implementation of new tools has clearly followed the general development of ICT solutions. The scope of the chapter is in the transition from traditional office work towards knowledge work from the viewpoint of worker well-being. Our research questions are 1) what connections and research trends can be identified between ICT supported work and stress and well-being at work and 2) what is the role and connection of ICT on knowledge work. Based on our literature study from electronic databases surprisingly few research articles focussing on ICT’s role on knowledge worker wellbeing or knowledge work as such were found. Only a surprisingly small fraction of the research concerning ICT or tools seems to integrate relations between technology, work and worker well-being. However, we know much about the physiological or psychological reactions of the use of VDT (visual display units) applications. This relatively narrow, even if important focus is not enough for workplace and job designers’ knowledge accumulation and exploitation. There is a risk that new researcher generations are maturing without being aware of the rich Northern European and German research tradition in developing the quality of work life. Thus, the existing body of knowledge is not fully exploited anymore. This also challenges our university teaching.

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INTRODUCTION

From the early stages of mankind people have used tools to conduct their tasks whether concerning their immediate survival in the environment or preparing tools for the forecasted needs. Designing, producing and utilising these primitive, simple tools took most likely place within relatively closed, small communities. At the same time, the designer, manufacturer and user of the tool was the same person or a member of her/his family. In other words, the connection between the tool designer, maker, and user was seamless, and the purpose and requirements of the tool were well understood. The key concept of the design, even if not explicated, must have been functionality, and the best available know-how was taken in use both during the design and production process and in the final use of the ready made tool. Learning by imitating and doing, repeating successful processing methods, and later on using language and visuals to pass on traditions e.g. about most value-adding and usable tools, have been powerful means of sharing existing and creating new knowledge.

The Legacy of Industrialism

Most of these archaic fundaments we can still relate to our current and future working life but at the same time something has also dramatically changed. Western industrial history shows how planning and designing, manufacturing and usage of products were in the name of efficiency separated from each other. Grounds for this industrial philosophy were set in Taylorism, and the mass production concept together with standardization of work, tools and methods by Fordism only reinforced ‘the one fits all thinking’ in designing working tools and methods, managing work, leading organisations, and even in fulfilling customers’ needs. Since early 1900 on, the Western working life has been influenced by the legacy of Taylor and Ford, only the modern applications of their management and production philosophies may appear slightly modified from the original ones. However, even if the need for standardised, physical human labour has significantly decreased, and the demand of non-routine, highly skilled knowledge work has increased, our management systems and leadership paradigms still overly rely on the world view of tangible, measurable work performance and controllable workers. Technological advancements from mechanisation to automation and information digitalization have emancipated us from repetitive, routine-based, often also from physical labour. We argue though, that most of the design of modern tools, methods and processes takes place too far from the actual workers. Only recently open source software development and crowd sourcing have brought the end-users closer or even into the core of ICT (information and communication technology) tool design and programming. We can still question, if we have really taken into account the nature of current work in designing and implementing the numerous amount of various ICT solutions and information systems. Often users become frustrated when ICT doesn’t support their work flow, disrupts working and thinking processes, and in some cases even destroys output of several hours’ work due to “computer crash” or errors in computer programs. However, already in studies conducted in 1970s working with computers was shown to cause stress to users.

The Ambiguous Nature of Knowledge Work

In knowledge work, the relationship between knowledge workers, their context-specific work content and ICT tools and methods used to complete the tasks can be argued to be especially complex and complicated. Skill requirements are usually high, and learning of new skills is continuous. For example, Järvenpää and Immonen (2002) have differentiated knowledge work from information work based on the level of process-
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