

# A FRAMEWORK FOR ETHNOGRAPHIC HUMAN FACTORS STUDIES IN PRODUCT REALIZATION SYSTEMS

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## **Abstract**

The aim of this contribution is to set the theoretical and methodological underpinnings for the study of human performance in complex product realization systems. Hence, starting from a sociotechnical systems perspective, the goal is to gather the tools and knowledge to develop pragmatic explanations of the human mind at work within these systems in order to generate (re)design seeds for technological artifacts and new organization of work that support increased system performance as well as human well-being. As a research embryo in itself, the realization of this ambition necessitates an empirical focus and seeking partners, namely manufacturing companies with industrial capacity that are implementing or have implemented technological developments, aiming added performance and added productivity, and where human work is increasingly cognitive. Hence, the research question that is to be addressed is in the lines of 'How does new technology in production (design, prototyping, manufacturing) and distribution activities, which is aimed at increased performance (efficiency and responsiveness or agility), create a shift in the activity of human collaborators (what are the adaptations, workarounds and shortcuts that make work more feasible)?'. The research is to be developed as a series of case studies, each one focusing on one manufacturing company, or on several companies at a time that are involved in a supply chain, with a focus both on boundary-spanning and non-boundary spanning activity. The selection of parts of systems to focus on, while keeping to a holistic systems perspective, will be based on the premise of change, where recent change has taken place, in terms of introduction of technological systems, or new forms of work organization with support from Information and Communication Tools. The method involves the inductive approach to research, interviewing with management to define the core systems to be focused, as well as reviewing existing data on processes configuration, outcome and efficiency. This is then followed by using ethnographic methods, including shadowing of 'key'/pivotal human operators, to collect data on their activity in interaction with the new or improved systems (these are defined/selected based on a combination of criteria considering their decision-making latitude and their scope of interactions with the technological systems focused upon). This is followed by a categorization of the observations and interviews and the search for patterns of adaptations, workarounds and shortcuts that the technological change has created. The understanding of the capacity limitations and any misfits between the technology, the goals of the activity and the actions carried out will trigger opportunities to spawn

conceptual ideas for innovating the organization of work and for technological system refinements, improvements, and or, new (human cognition supporting) functionalities. An outline of envisaged training and competence development needs are also envisaged as possible outcomes of the research process. The envisaged results are case studies on the impact of technological change and the lessons learned from empirically studying cognition in the world of contemporary manufacturing and distribution systems. At the same time it is expected that the development of suitable methodologies for data coding and analysis is to ensue, together with sociotechnical systems theory-based analysis of both supply chain boundary spanning and non-boundary spanning processes in manufacturing companies.