

Quality and Ergonomics

- towards successful integration -

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AKADEMISK AVHANDLING

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ABSTRACT

The understanding and practice of ergonomics, built on the knowledge of human characteristics, abilities and needs, plays a fundamental role in satisfying people – whether they are labelled customers, users or workers. In this context ergonomics and quality can be regarded as overall approaches, as philosophies taking account of people in the way things are designed and organised. Given the conceptual similarities and that several indicators point to the fact that poor ergonomics may cause quality deficiencies, there has in recent years been an increased focus on the potential benefits of an integrative approach.

The research presented in this thesis aims to support this process by developing a broader understanding of relationships in-between ergonomics and quality issues and to generate knowledge on how to effectively integrate quality and ergonomics development. The research project covers data and experiences from twenty-four case studies. A clearly marked interdisciplinary and triangulated research strategy with empirical data, qualitative as well as quantitative, from observations, interviews, surveys, and descriptive statistics, forms the basis of new knowledge, theories and methodology.

The results show that there is a strong relationship between a number of ergonomics related issues and quality performance. Deficiencies in information handling, management, work task and workplace design and motivation are important causes of poor quality. It is shown that quality deficiency rates increases substantially for adverse work postures compared to good postures, and that ergonomics improvements can reduce quality deficiencies with 30-50%. Further studies show that a feasible and often necessary strategy in creating lasting improvements is to integrate the perspectives of employers, employees and customers - i.e. efficiency, work conditions and quality. To achieve this a number of participatory techniques and support systems have been developed, studied, empirical tested and evaluated.

It is shown that a kaizen based suggestion system focusing on participatory ergonomics promotes motivation, commitment and high performance – quality as well as productivity. Nearly six out of ten suggestions deal with ergonomics issues and one out of five involves both ergonomics and quality improvement proposals.

Furthermore an integrated participatory problem-solving approach, using both quality as well as ergonomics methodology and tools has been developed and empirically evaluated. It is shown that ergonomic tools are well suited in the quality improvement process, and that participatory ergonomics not only can be used as an effective tool eliminating ergonomic problems but also to progressively improve learning, working conditions and performance, thus stimulating a positive development of quality.

The thesis also presents a balanced strategic management concept with the potential to integrate ergonomic issues at all levels. An integrated macro-ergonomic management concept is believed to have a great impact on improving people's job satisfaction, performance and quality of working life, thus helping to create the environment in which total quality management and quality improvement will flourish.

It can finally be concluded that quality work is not just concerned with developing products and processes but equally with giving the people involved in these processes a chance to develop and to perform a good job. Designing a work system in accordance with ergonomic principles can thus be seen as a quality issue in which the internal customers' (employees') requests of ergonomics are given a high priority.

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