Strategic foresight at work - approach to future thinking in ergonomics

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Abstract. Strategic Foresight at Work (SFaW) is a new approach to incorporate future thinking in Organizational Design and Management.

Keywords: Ergonomics and human factors, strategic foresight, future thinking, technological development.

1. Introduction

The strategic foresight (prospective) is an interdisciplinary perspective whose purpose is resisting technological determinism. Every technological change can be related to ergonomics, either in its origin and conception or as a consequence when being implemented in daily life. Nowadays people cannot make serious decisions about innovations and technological development. Ordinary people don't decide where, when, or what technologies can be produced. SFaW is presented as a first phase to approach strategic management, technological planning and future thinking methods related to ergonomics applied to work.

This document begins by presenting the theoretical basis and definitions about future thinking, as well as methods and future studies related to strategic foresight. The research process includes a systematic review and analysis of links between ergonomics and futures studies. Finally, implications for ergonomics foresight and future thinking in technological development are articulated by stating the main principles of a new model of SFaW. This is very important in countries like Colombia, where political aspects are almost never included in ergonomic interventions.

2. Methods

First, the main principles of future thinking were cross-checked against the largest schools of thought. For this goal, a systematic review of the main documents and authors was made. Books and primary sources of information were organized by characterizing: 1) the school of expected future and, 2) the school of the desired future. In this way the main interests and theoretical bases were identified. Secondly, methods and techniques for future thinking were characterized. The information was organized in a matrix looking for relations and differences between schools. The matrix was used for answering one question: what is the difference between the expected and the desired future? Finally, a matrix comparing the two approaches and related methods and techniques was built, including a category for analysing the implications for future thinking in the theory and practice of ergonomics.

3. Results

In the future studies three principles were developed: 1) the dilemma between the desire and fear about future, 2) the only space for impacting the human action is the future, 3) there isn't a single future, there are multiple futures. On this theoretical basis two main approaches about future thinking were built. The first one looks at the probability of the occurrence of an event. The second one is centred on building the future and looking for the goals. Table 1 shows the main aspects of techniques and methods of both approaches.

Table 1. Differences between two schools of future thinking

Expecting the future – What's coming up?			**Desiring the future – How to build the future?**		
Methods and techniques: Micmac, Maxtor, Technological Vigilance, Delphi, Consensor, Smic, Quest, Trends Research, Linear Regression and Estimation Techniques, Road Mapping.			Methods and techniques: Delphi, Scenario Planning, Expert Panel, Focus Groups, Actor Analysis Methods, Morphological Analysis (Problem Solving), Cross-Impact Analysis, Brainstorming, Interax.		
Variable	Characteristics	Ergonomics role	Variable	Characteristics	Ergonomics role
Environment	Static	Repair and adjust	Environment	Dynamic	Projection and renewal
Data	Quantitative and qualitative – known	Rigorous data analysis	Data	Quantitative and qualitative – unknown	Flexible with multiple possibilities
Source data	Past and present	Recollect data bases and history of technologies	Source data	Present and future	Identify the best conditions for processes and people
Kinds of future	Unique and certain	Only one ergonomic intervention is possible	Kinds of future	Multiple and uncertain	Propose multiple scenarios for ergonomics interventions

Source: elaborated by authors

Techniques and methods of the expected future are based on what happened in the past and what happens in the present by incorporating forecasting, prediction, prevention and promotion, excluding value judgments and aspirations. Techniques and methods of desired futures are based on prospective judgments, where people can incorporate their ideals, dreams and value judgments.

SFaW is proposed to incorporate both techniques and methods of the expected future, and techniques and methods for the desired future. Two models are proposed; first, an organizational management model that explicitly incorporates future thinking, and second, a management model for organizational design that considers the relationship between people and technology.

By incorporating SFaW as a model for future thinking, enterprises can generate a more competitive approach beyond an economic perspective. With the incorporation of a prospective approach to prevention actions or programs, derived technological changes can be made more suitable for human being – technology interactions.

SFaW can be also useful for establishing state policies regarding economic activities or industrial sectors, benefiting the larger population while interacting with their technologies. Nowadays road mapping and governmental plans are the prevailing techniques and methods for technological developments in Colombia. SFaW allows not just enhancing these methods but incorporating a new, more inclusive, ideology.