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The Ergonomist: a full design actor

Example of an ergonomic action

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Abstract

Activity-centered ergonomics has developed an approach to provide support for design projects which comprises ergonomics work analysis, participatory design and simulation of work. This approach leads us to appreciate the reality of work in order to design systems which are adapted to human's abilities and also to the tasks to be performed. However, beyond the technical recommendations, ergonomists may take part in project management. In fact, for some years now, they are no longer satisfied with merely providing the information and advice they have discovered through work analysis. In order to take into account functional requirements of work situations, they now try to influence the very way in which projects are managed and thus influence the design process itself. This perspective sheds a new light on the ergonomist's positioning as a full design actor or as a co-designer. This type of contribution is possible from the early phases of feasibility until the installation start-up. We will try to illustrate this perspective through the results of an ergonomic intervention in an industrial design project.

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1. Introduction

Designing workspaces have the power to open or close fields of possibilities to users' future activity. These design choices are sometimes essential resources or, contrariwise, strong constraints with consequences in terms of efficiency, reliability, health, life or work conditions, and quality of service. Still, design processes are rarely based

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on a deep analysis of users' real activity and functional needs. One of the reasons is that designers (architects, engineers, etc.) are not necessarily in direct link with work situations and users concerned by the project. Therefore, they may not have in mind all the diversity existing in these working situations. In this context, activity-centered ergonomics (ACE) has developed an approach to provide support for design projects which includes work analysis, participatory design and simulation of work. This approach gives an appreciation of work reality in order to design systems that would be adapted to human's abilities as well as to the tasks to be performed. But ergonomists do not purely influence the projects' content. Their contribution may also impact the way these projects are carried out. The aim of this paper is to underline that, beyond the technical recommendations; ergonomists may take part in project management. This perspective sheds a new light on ergonomist's positioning as a full design actor or as a co-designer. This paper aims to illustrate this perspective through the telling of an ergonomic intervention in an industrial design project. The ergonomists' contributions are discussed by analyzing the project in which the authors participated.

2. Context and demand

The intervention concerns an aeronautics workshop of fifteen workers. The main activity is to adjust, control and pack pieces of planes' engine. With the increase in production's rate, the management board decided to modernize this workshop and has invested in new machines. Initially the workspaces were designed for smaller production volumes. This resulting need of space has made it compulsory to run a redevelopment project. Few years before, two attempts had already been conducted in this sector and were unsuccessful. For this third project, the chief investment did not want to repeat the past mistakes and decided to appeal our services. Working with ergonomists in such a project was a new experience for the firm. In this context, design actors had a limited and vague representation of our field of expertise: "the ergonomist provides recommendations on physical conditions (acoustic, lighting, ventilation...) and on workstation arrangement (work surface height, furniture, etc.)". The initial claim for benefits reflected this representation. The request was to "improve existing workstations by taking into account the redevelopment project". However, we assumed that our contribution would go further than this one mission. This paper shows the methodology used to do so and the results obtained.

3. Project analysis

The first stage of the intervention was to understand the four dimensions of the project: 1. The strategic goals and objectives; 2. The stakeholders' organization; 3. The progression level of the project; 4. And experience feedbacks.

3.1. The strategic goals and objectives

Above all, it must be specified which strategic goals the project is supposed to meet, and what the objectives and the extent of the project are. Originally, the purpose of the project was to arrange the space in order to optimize the new investments and modernize the production equipment. With the increase in the number of produced pieces and the lack of space, the production line had become increasingly cluttered. The obtaining of a workshop adjacent surface triggered the emergence of the project. With the purchase plan and the extra space acquisition, the managers wanted to make the production flow more readable and efficient. Furthermore, the chief investment who was sensitive to health and safety issues wanted to take advantage of this relocation to integrate prevention at an early stage of the design. Very quickly, he talked about load handling problems, repetitive movements, noise, dust, lighting, etc. Besides the budget, his concerns focused on improving working conditions as well as on involving operators in the project. These were the original reasons why ergonomists had been asked to participate. In this context, and before any action, it was necessary to understand the key points of the project and the state of progress.

3.2. Project progress

The project had reached the basic studies, and a draft plan was developed by the investment chief (Fig. 1).

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