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## From the workers' activity to the ergonomists' action

François Daniellou

The fiftieth anniversary of the SELF foundation, and this plenary session, are an opportunity to bring up questions about SELF's specific contribution to the development of Ergonomics in the world, trying once more to establish which light "activity oriented ergonomics" sheds on international debates about our discipline and profession. The reading of the position paper "*A strategy for human factors/ergonomics: developing the discipline and profession*", by Jan Dul and other outstanding contributors, was the starting point for this reflection exercise. Due to the limited time of this presentation, it will focus only on work system ergonomics, which addresses the production of goods or services. Mass product design might require different developments.

An "activity oriented" ergonomist feels comfortable with many of the assertions presented in the paper, notably the facts that Ergonomics has a system approach and is design driven. But he/she completes the reading of the paper with a strange feeling, partially expressed by Nathanael and Marmaras's commentary: "fitting a system to the human" appears to be rather simple for good experts of high-quality HFE, as long as they have at their disposal updated knowledge and methods. Their main problem seems to be the marketing of their talents. We must admit, on the other hand, that our everyday life is one of struggles, contradictions and conflicts, negotiations, successes and failures.

To understand this discrepancy, let us have a look together at any workplace, with our different pairs of glasses. Many HFE specialists will "assess" this workplace, using "scientific criteria" to evaluate which components of the system are adequately, or poorly, fitting "human capacities and aspirations", resulting in lower or higher levels of "well-being" and "performance". An "activity oriented" ergonomist will try to understand how the worker struggles to do his/her work well, in the midst of a number of constraints and contradictions, and which consequences this activity may have on performance and health.

Indeed designers and organizers have set up the work means, by using general, technological knowledge about the products and processes. But, in spite of the attention paid to this anticipation, what will happen in real time always differs from what has been planned: the material drifts from its reference state, the tools wear out, incidents occur, clients have unexpected demands, etc. Even in highly taylorist surroundings, variability is the rule. If the worker merely did what he/she is prescribed to do, little production would come out. When they do that, it is called a work-to-rule strike, and production is blockaded.

Any worker has to compensate for the limitations of the design anticipations: the gap may be wide in the case of poor design, it may be smaller in that of better design. But it is always present. To take care of the situation as it is, the worker mobilizes his/her body, his/her intelligence and experience, his/her networks, but also his/her subjectivity and values to strive to do "well done work". He/she puts into play an adaptative activity to try to balance the production goals, the expectations of clients or colleagues, the actual state of the system

and of means available for work, the capacities, limitations and variations of his/her body, and the compliance with his/her values. He/she continuously builds trade-offs between those contradictory drives; in difficult situations, the inevitable imperfection of those compromises may result in performance and/or health problematic outcomes. Activity analysis is an attempt to understand the determinants of this adaptive activity, its favourable outcomes, its frustrations, as well as its costs in terms of both performance and health.

If you accept to follow us on this line of approach for a few more minutes, let us try to draw some of its consequences as regards models of the human, and targets of ergonomic interventions.

HFE models of the human started with physiological references, that have permitted to understand detrimental effects of many efforts, postures, environmental conditions or perceptual activities. Then, they began to include cognitive dimensions, not only in intellectual professions, but also in so-called “manual work”. Information processing, representation building, cognitive interactions, decision making, cognitive strategies have become common references for many HFE specialists.

The explosion, not only of psychosocial risks but also of musculoskeletal disorders imposes us a new inescapable challenge: we have to endow our models of the human with credible and operating descriptions of the mobilization of subjectivity at work. The paper mentioned above refers to human “aspirations”. Unfortunately, “well-being” is not a state, whose boundaries can be easily defined and assessed. The human incessantly struggles with the urges of life desires and their framing by social norms. His/her health hinges on his/her capacity to build, in interactions with others, his/her own route, in which “being oneself” results reasonably acceptable for the society.

It is now clear that *work* is one of the major arenas of this confrontation between the individual’s own norms, and society’s norms. This means that favourable work situations are those in which the worker happens to influence the environment, in order to yield outcomes in which he/she can recognize something of him/herself. If so, the person develops his/her competence, and work is likely to have a positive contribution to his/her health. But if, which turns to be more and more common, the type of quality required by the organization, or the means available to reach it, are antagonistic to the workers’ motivations and values, he/she may persist for some time in struggling in the shadow, alone or with the work group, to do his/her work well, in spite of, or against, the organization. If these desperate attempts finally fail, his/her health is put at risk, and psychosocial risks or musculoskeletal disorders are highly presumable consequences.

What is at stake ultimately in the workplace are the conditions of the confrontation between two types of knowledge: the scientific and technological knowledge thanks to which the workplace has been designed and organized by anticipation, on the one hand; the experience and embodied knowledge of those who hold the work position and who, day after day, mobilize themselves to take care of what has not been anticipated by the organization, on the other hand. Oftentimes, this confrontation is defective in at least, two

key stages: at the design stage, and in everyday production organization. In many organizations, decision makers' knowledge has few opportunities to come across workers' knowledge.

The ergonomists' task is, indeed, to introduce knowledge about the human at work in the design or the redesign of work systems. But it is not only that: we have to foster the confrontation of different knowledge, different standpoints, different logics in the design or redesign process. Holding together performance and health in HFE interventions is not a smooth optimization process. It cannot make do with ergonomic recommendations. It is the introduction, in the organization, of new actors, new descriptions, new models, new debates, new design objects, new methods, new criteria, structured around one central question: what is the room for manoeuvre that is required and possible in the future system, so as to enable the workers to do their work well – whatever the variability of the context –, at an acceptable individual and collective human cost, to develop their competence and to contribute to an on-going development of the system itself ?

Thus described, the ergonomic intervention has little to do with the mere application of scientific knowledge about human properties. The ergonomists need methods to analyse the determinants of the contradictions which activity has to cope with in a given workplace; to build one's right place among designers, decision makers and other stakeholders; to organize simulations of possible activity and its consequences for performance and health in a future system; to promote the confrontation of various stakes and the building of unexpected trade-offs.

Of course, knowledge can, and indeed should, be produced about these action processes and the relevant methods to steer them. But this knowledge may not be developed in the lab: it requires a systematic approach to building models of ergonomic interventions – addressing different contexts –, the publication and teaching of these models, their public critique among the profession, and their continuous iterative improvement. We are raising here a major epistemological question: not only is knowledge the source of HFE action; action, and its modelling, is a key source of HFE knowledge.

So, now, what about the marketing of HFE interventions? As a matter of fact, the processes we have just been describing are nearly unmarketable as such! In most cases, you just can't advertise on the importance of new actors playing a role, on the virtue of contradictions and debates. Still, we share with the above mentioned paper the idea that there are so many preoccupations that ergonomics may address, affording such as diverse gateways as occupational health, production and quality stakes, major risks, prevention of exclusions, return to work, age management, etc. We could add to this list the specific own difficulties of shopfloor or middle managers.

The clients or possible clients of HFE specialists do not need HFE: they need help; tailored help! It is the discipline and profession's duty to develop methods and knowledge that foster the capacity of professionals to be present in the right place at the right time, to perceive these preoccupations of a number of stakeholders, to negotiate and to build interventions adapted to each context, to accompany the stakeholders all the long way from the expression of their concerns to the redesign of the system; to draw lessons from successes

and failures, and to circulate and discuss in the community capitalized feed-back on intervention methods.

As a conclusion, let us sum up some possible contributions of this SELF congress to the IEA debates:

- 1) The object of ergonomics is to promote favourable conditions for the development of purposeful human activity, through an action on the design of systems;
- 2) Workplaces – in their technical and organizational dimensions – should not only be innocuous, they should foster the development of the individual, the work groups, and the system itself: we aim to contribute to the design of enabling environments and learning organizations, which requires assuming contradictions and promoting debates;
- 3) An ergonomic intervention is not a mere added contribution to existing decision making processes in design or organizing: it changes the decision making processes themselves, the actors involved, the topics that are tackled, the criteria that are used;
- 4) Knowledge has to be produced about these action processes, through iterative modelling and assessing of field interventions: this requires forms of collaboration between academics and practitioners that be significantly different from the “knowledge supplier / knowledge user” model. A continuous improvement loop, involving structured interactions between researchers and practitioners, is necessary to test and to develop these models;
- 5) “Performance”, “health” or “work organization” are not obvious, univocal concepts. The IEA has a specific role in 1) promoting internal debates about them and 2) interacting with such disciplines as management science, economics, sociology, anthropology, psychology and psychopathology, to promote a vision of human development at work as an inescapable condition of sustainable performance;
- 6) HFE, and the IEA, have a vital interest in tackling such epistemological questions, and in analysing – and if necessary combating – the limitations that the positivist approaches to science production and scientific publication impose to the production of knowledge about action.