Is There a Clear Understanding of Using Human Factors and Ergonomics at Work?

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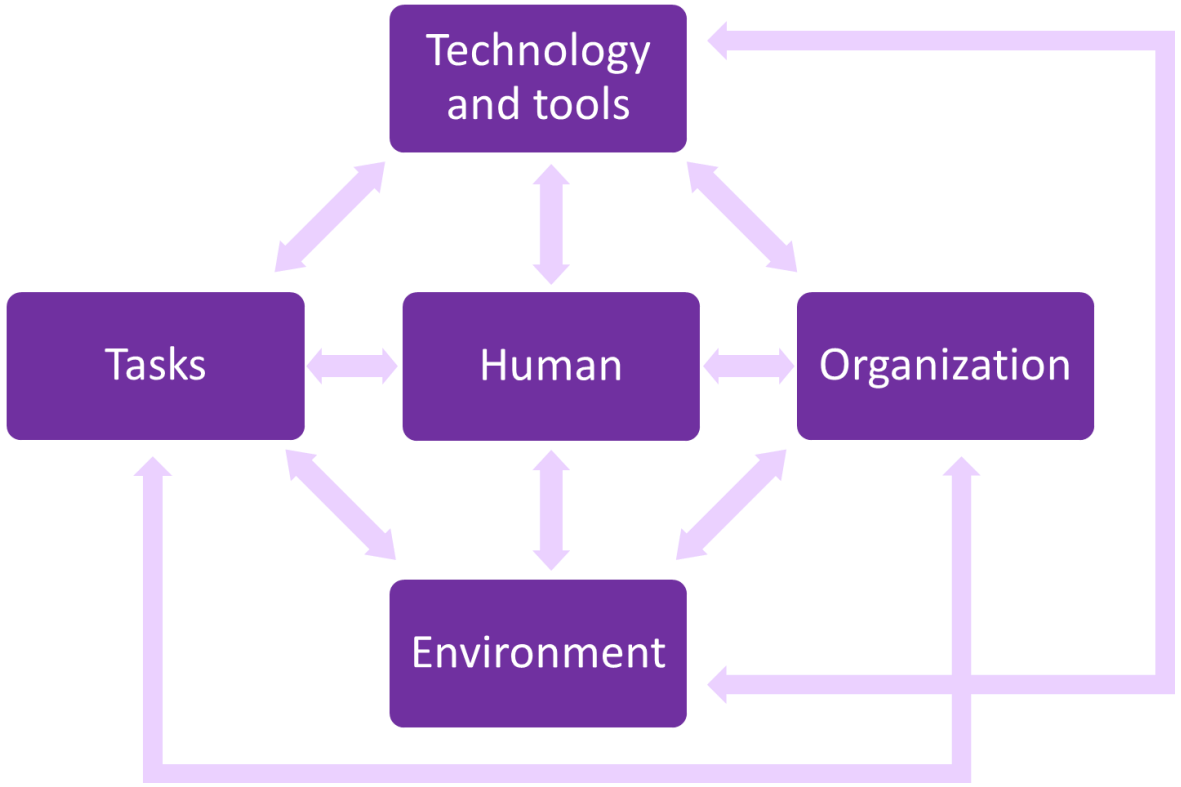
Human factors and ergonomics (HF/E)



(Dul et al., 2012; Smith & Carayon-Sainfort, 1989)

- Aims to understand interactions among humans and other system elements (Dul et al., 2012; IEA, 2020; Smith & Carayon-Sainfort, 1989)
  - Applies theory, principles, data, and methods in design to optimize overall system performance and sustainability (IEA, 2020; IEA & ILO, 2020)
- The interactions between various subsystems can be of a physical, cognitive, and psychosocial nature and at different levels, from microergonomics to macroergonomics issues (Carayon, 2006)
- Main focus on prevention and proactivity
  - A systematic approach uses a step-by-step, iterative process model, from analyses and assessments to design recommendations, requirements, specifications, and actions (Dul et al., 2012; EN ISO 6385:2016, 2016)

Who is capable of using HF/E in workplaces?

- HF/E specialists' core competencies (IEA, 2021):
  - foundation knowledge,
  - HF/E measurement and analysis skills,
  - HF/E evaluation skills,
  - HF/E recommendation skills,
  - HF/E implementation skills,
  - scientific skills,
  - and professional behaviour
- European ergonomists – professionals who are experienced in using knowledge from the areas of (CREE, 2023)
  - anatomy,
  - physiology,
  - psychology,
  - social organization,
  - and the physical environment to design work systems, structures, and activities to optimize human performance and well-being
- In Finland, occupational healthcare could use professionals who have education of the field of HF/E and have adequate knowledge of occupational healthcare

→ It is not clear what HF/E or ergonomics means in practice, who HF/E specialists or ergonomists are, what they do, and where they work

Materials and methods

- “People in designing work and the working environment – a handbook for the proactive planning of work and design of working environments” (hereafter referred to as the “handbook”), commissioned by the Finnish Ministry of Social Affairs and Health (Halmeenmäki & Myrsky, 2021), served as a basis for the debate
- A questionnaire (between 25 October and 8 November 2021) to collect international HF/E experts’ (n = 8) opinions on the proactive design of work and work environments
- Qualitative interviews with Finnish HF/E professionals (n = 9) (between 12 and 26 November 2021) with a semi-structured interview form
- The questions of both data collection methods were based on the handbook.

Materials and methods

- Respondents (questionnaire)
  - academic education from HF/E
  - tens of years of experience as teachers and researchers and/or as HF/E professionals
  - five in companies and three in universities
  - Europe and Nordic countries (n = 6) and North and South America (n = 2)

- Participants (interviews)
  - experienced with HF/E, occupational safety and health, well-being at work, and/or design science
  - from research institutes, universities, expert companies, associations, and public authorities
  - different regions in Finland
  - eight in group interview, one individual interview

Results - questionnaire

- Who does the planning of work and designing of work environments in workplaces
  - manufacturing engineers, the production technology department, the heads of departments, union representatives, employee representatives, facility management, the ergonomics department, HR department, HR specialists, OSH specialists, ergonomists…
- The responsibility for taking care that all needed HF/E actions are done belong to either the HR department or to the employer, or to be dependent on the governance of the organization
- The responsibility of the whole work design process belong to the line or production manager or to the ergonomist
- Responsibility for the needed HF/E knowledge belonged to the employer, HR department, HR specialist, or the production manager
- HF/E professional
  - should monitor that the ergonomics requirements – physical, cognitive, and mental – are fulfilled and that the potential risks are minimized
  - should understand how people cope with their jobs in the intended work, how they adapt, and which factors they find it difficult to adapt
  - should play a supportive and controlling role in the whole process right from the beginning
  - should have more competencies in production and logistics.

Results - interviews

- In Finland, there is no clear picture of
  - ergonomics experts,
  - their definition, or
  - who they are
- The unclear definitions of ergonomists and ergonomics may lead to false impressions
  - ergonomics in public discussion is understood mainly as physical ergonomics

  → If there is no understanding about the other aspects, occupational healthcare service providers use physiotherapists and offer their services when asked for a professional in ergonomics (named in the Occupational Health Care Act)
  - Occupational physiotherapists are professionals in their field but not ergonomics experts in a wider sense

Discussion

- No consensus about HF/E professionals and their roles and responsibilities in implementing HF/E in system approach design driven activity where target is overall performance of the system and human wellbeing in the system in question
- No clear understanding of
  - what planning of work and designing of work environments means,
  - who does the planning of work and designing of work environments in workplaces,
  - who has the responsibility for taking care that all needed HF/E actions are done,
  - who has the responsibility for the whole work design process, or
  - who has the responsibility for the needed HF/E knowledge

Discussion

- How the work system is described and what the focus is on different roles and tasks of the actors in the different institutes and workplaces when the performance of the entire system and the well-being of a human at work need to be improved?
  - Healthcare-driven professionals do not necessarily have skills and competencies in analysing systems, e.g. manufacturing lines, design processes, logistics, and hospital ward
  - Managers often do not have the skills and competencies to design and analyse the effect of changes in work processes on the entire process performance and well-being of humans

  → There is a need for professionals who can utilize HF/E theory, principles, and standards as part of their daily work

Further studies

- In the case of using the definitions of IEA (2020; 2021) and CREE (2023), a map of interfaces and needed HF/E proactive design-driven actions, competencies, and skills in different places and positions in the organizations and workplaces could be created
- Material and guidelines for managers and designers are needed to describe organizational needs and ways of working with internal and external stakeholders for utilizing HF/E in design-driven activities on micro- and macro levels
  - This would help stakeholders find the interfaces where collaboration is needed and conduct systematic fact-based design-driven proactive activity

Conclusions

- Responsibilities and roles in design-driven activities were unclear

→ A need to widen the public discussion and view on HF/E specialists in workplaces and sharpen the education and utilization of them

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