Information Ergonomics for Digitalizing Work

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Laura Bordi (laura.bordi@tuni.fi)
Project Researcher
Tampere University
Faculty of Management and Business, Wellbeing at Work Research Group

Sustainable Brain Health Project (2020–2023) (Kestävä aivoterveys)

- Funded by the European Social Fund (ESF)

- Objective is to study and develop practices that reduce strain and support brain health at work.

- *Brain health* is approached through the concepts of cognitive ergonomics, **information ergonomics** and affective ergonomics, as well as ethics-related stress and self-management.

- Collaborators: Tampere University, Tampere University of Applied Sciences, Tampere University Hospital, Oulu University of Applied Sciences

- https://www.tuni.fi/fi/tutkimus/kestava-aivoterveys

Background:
The need for information ergonomics

Increased ICT at work

→ Increased information intensity

→ Increased information processing, interruptions, task fragmentation, multi-channel communication, constant connectivity, multitasking...

→ Increased workload and stress

Example of a workday in the digital work environment

Activity during workday (averages)	Organization A	Organization B	Organization C
Proportion of time spent on computer	74 %	74 %	73 %
Frequency of switches between applications/documents	36 sec	58 sec	53 sec
Number of switches between applications/documents	700	513	470
Frequency of switches to communication tools	2 min 7 sec	2 min 17 sec	3 min 17 sec

(Example from research project *Enhancing productivity, customer experience and wellbeing at work through information ergonomics* [2015–2017, Tekes] by Bordi, Okkonen, Mäkiniemi & Heikkilä-Tammi)

Digital work environment and stress
(measured by logging and HRV, n=36)

→ Lots of interruptions, task switches, multitasking and digital communication activities

- Shorter task sequences***
- Increased application switching***
- Higher communication intensity***

→ **increased stress**

***Correlation is significant at the 0.001 level

(Example from research project *Enhancing productivity, customer experience and wellbeing at work through information ergonomics* [2015–2017, Tekes] by Bordi, Okkonen, Mäkiniemi & Heikkilä-Tammi)
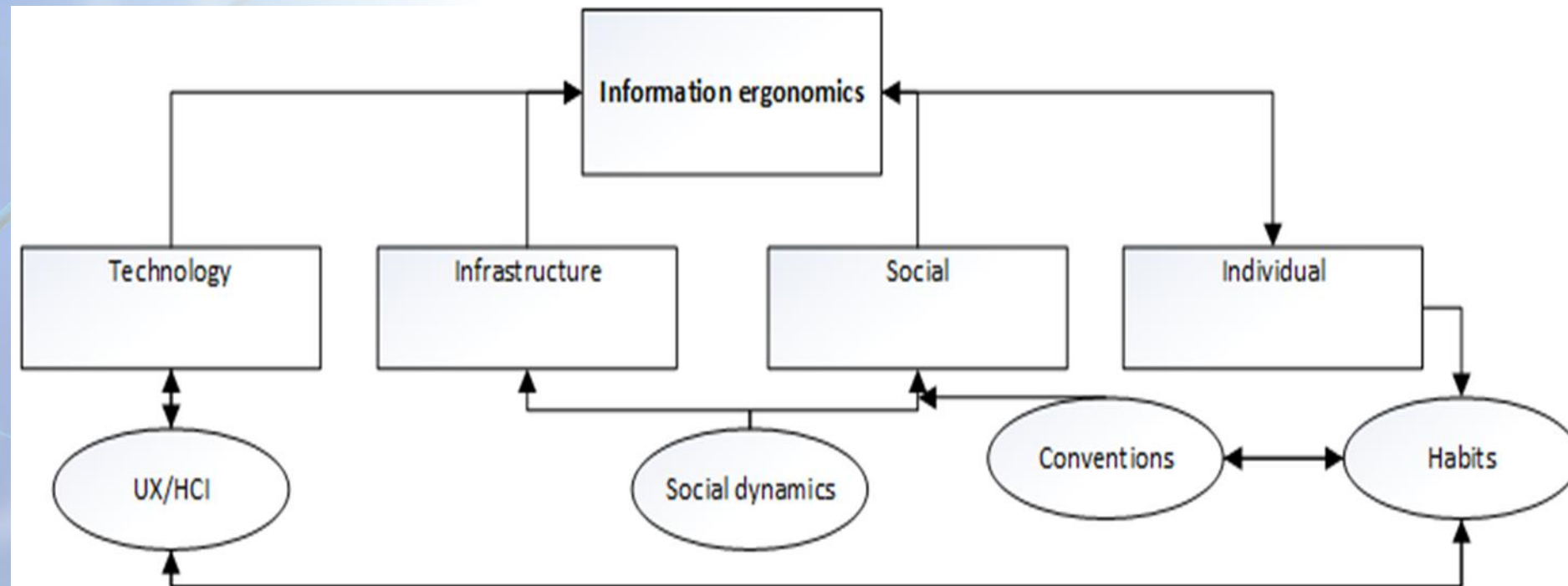
Information ergonomics in short

- An evolving part of ergonomics, focusing on the management of information load at work

- Deals with the fit between workers and their digital work environment as a whole (technology, infrastructure, social and individual factors)

- Aims to enhance wellbeing at work and productivity by reducing information load and enhancing digital work environment's role as a resource

(Franssila, Okkonen & Savolainen 2016)
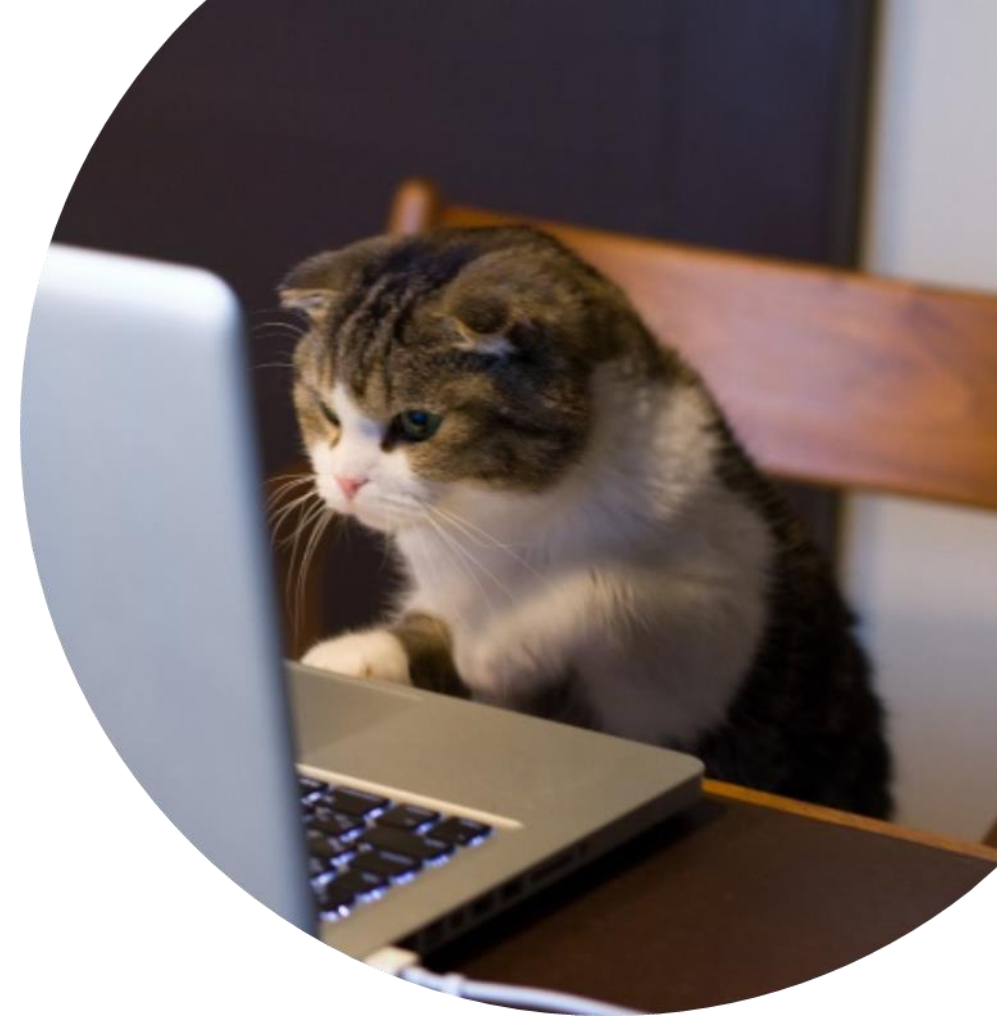
Components and perspectives of information ergonomics

(Okkonen et al. 2017)

How to enhance information ergonomics in the workplace?

Promoting participatory and end-user centered approach to technology implementation and use

- Tailoring orientation and training to the needs of user groups and their work tasks

- Allotting enough time for learning

- Facilitating sharing of knowledge and best practices in technology use

Establishing shared practices and etiquette

- Which communication channels we are using, how, and for what?

- How do we handle shared email accounts or ticketing systems?

- How do we reduce unnecessary messaging in the organization?

- Could / should we determine response times?

Providing employees more opportunities to control their work

- Ensuring opportunities for uninterrupted work
- Discouraging constant connectivity
- Clear objectives make it easier to schedule and prioritize in an "ergonomic" manner.

Paying attention to one's habits

- Do I check email / other communication apps constantly? Maybe also outside working hours?

- Do I bombard colleagues / employees / business partners with multiple messages / phone calls if they don't answer immediately?

- Do I keep multiple documents / applications open on my computer, even if I don't need them in the current task?

- Do I generate unneccessary communication load by messaging in a hurry and then sending two more messages to complete the first one?

Closing notions

It's important to pay attention to the comprehensiveness of information ergonomics:

- Organization of work

- Organizational culture and practices

- Leadership

- Work teams' conventions

- Individual habits

→ These all play an important role in managing and reducing information load at work.

References & further readings

- Bordi, L., Okkonen, J., Mäkiniemi, J.-P. & Heikkilä-Tammi, K. 2015–2017. *Enhancing productivity, customer experience and wellbeing at work through information ergonomics*. Research Project. The project's publications:
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  - Bordi, L., Okkonen, J., Mäkiniemi, J.-P. & Heikkilä-Tammi, K. (2017). *Employee-developed ways to enhance information ergonomics.* Proceedings of the 21st International Academic Mindtrek Conference. New York: ACM, 90–96.
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- Franssila, H., Okkonen, J. & Savolainen, R. (2016). *Developing measures for information ergonomics in knowledge work.* Ergonomics 59(3), 435–448.

- Okkonen, J., Heimonen, T., Savolainen, R. & Turunen, M. (2017). *Assessing Information Ergonomics in Work by Logging and Heart Rate Variability.* Proceedings of the AHFE 2017 International Conference on Usability and User Experience, 425–436.