

Keynote paper presented at the 38th Annual Congress of the Nordic Ergonomics Society (NES), 25 September 2006, Hämeenlinna, Finland

The business value of ergonomics

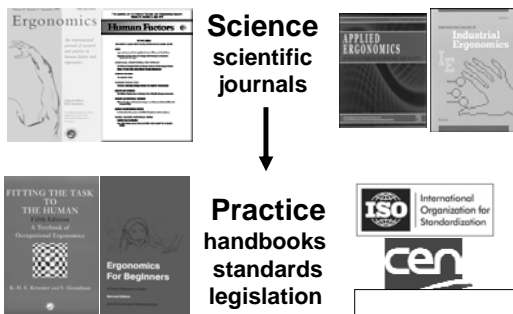
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Modern Times = (Neo) Taylorization

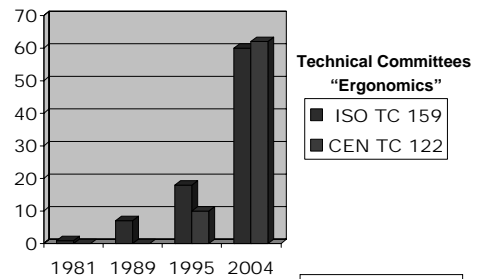
- Division of labour
- Standardization of tasks
- Selection and training of personnel
- Leave thinking to managers
- High productivity
- Monotony
- High speed
- Limited use of skills
- Health problems

50 years of ergonomics



Dul, J., Karwowski, W., Vinken, J. (2005). Objective and Subjective Rankings of Scientific Journals in the field of Ergonomics: 2004-2005. *Human Factors and Ergonomics in Manufacturing* 15 (3), 327-332

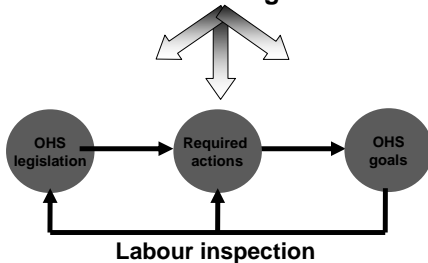
Published ergonomics standards (1981-2004)



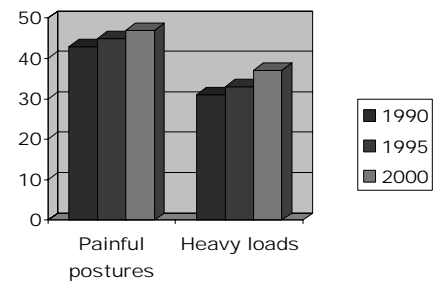
Dul et al (2004). Combining economic and social goals in the design of production systems by using ergonomics standards. *Computers and Industrial Engineering* 47 (2-3), 207-222

Mandatory ergonomics

Contribution of ergonomics

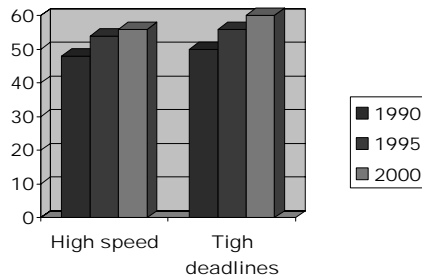


Physical workload in Europe (1990-2000)



Paoli and Merlié (2001). Third European Survey on Working Conditions 2000. European Foundation for Improvement of Living and Working Conditions, Dublin

Stress in Europe (1990-2000)



Paoli and Merlié (2001). Third European Survey on Working Conditions 2000. European Foundation for Improvement of Living and Working Conditions, Dublin

Statement 1

During 50 years, there has been ergonomics knowledge transfer via handbooks, standards and legislation. However, this has not enough resulted in decreases of physical workload and work stress.

Content

- What have we done to create business interest in ergonomics?
- Why the business world does not use ergonomics enough?
- What can we do more?

Management recognizes the importance of people

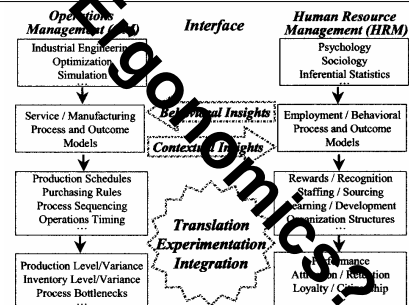
- “Our most important asset” (Annual reports)
- “Success Factor People in Distribution Centres” (European Logistics Association, 2004)
- “We shouldn’t forget it’s about people” (vice CEO, Unilever, 2004)

People are not important in most management-models

- People are not a major factor
- People are deterministic and predictable
- People are independent of other people
- People are stationary
- People are emotionless

Bourdreau et.al (2003). On the interface between Operations and Human Resource Management *Manufacturing & Service Operations Management* 5(3), 179-202, 2003

People are not important in most management-models



Bourdreau et.al (2003)

10 management areas of the production manager

1. Service and product design
2. Quality management
3. Process and capacity design
4. Location
5. Layout design
6. Human resources and job design
7. Supply chain management
8. Inventory planning
9. Scheduling
10. Maintenance

Heizer and Render (2004). *Operations Management* 7th edition Pearson Education International

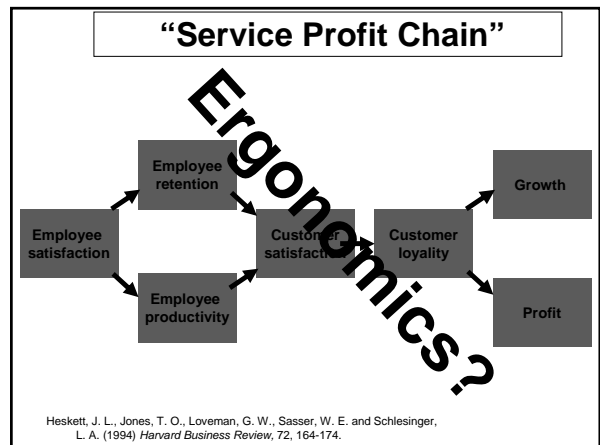
No management areas of the production manager

~~1. Ergonomics
2. Health and Safety
3. Lifting
4. etc.~~

10 management areas of the production manager

<ol style="list-style-type: none"> 1. Service and product design 2. Quality management 3. Process and capacity design 4. Location 5. Layout design 6. Human resources, job design 7. Supply chain management 8. Inventory planning 9. Scheduling 10. Maintenance 	<ol style="list-style-type: none"> 1. Ergonomics 2. Health and Safety 3. Lifting 4. etc. <p>↓</p> <ul style="list-style-type: none"> • Allocation of functions • Work organization • Workplace design • Manual handling
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(Arrows point from the 10 management areas to the ergonomics-related items.)



Managers are not told about ergonomics (!)

- 97 leading management journals (1992- 2001):
- 90 journals (93%) no ergonomics papers
- 7 journals (7%) 10 papers
- limited scope of ergonomics
- no papers from well-known ergonomists

Dul (2003). *Ergonomics in Management*, Proceedings IEA congress 2003, Seoul, Korea

Statement 2

The business world considers people important for realizing business goals, but does not see the potential of ergonomics.


Content

- What have we done to create business interest in ergonomics?
- Why the business world does not use ergonomics enough?
- What can we do more?

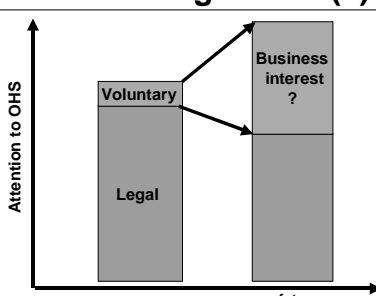
New approaches for OHS legislation (1)

From: 'command-control'
To: 'self regulation'

"If people can agree about something, then they are more likely to actually do it then when it is imposed on them"



New approaches for OHS regulation (3)



After: Fallentin (2004). Impact of regulatory initiatives for promoting musculoskeletal health. NIVA workshop Sweden, March, 2004


Definition ergonomics

"Ergonomics (or human factors) is the scientific discipline concerned with understanding the interaction among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance"

(IEA 2000)

Ergonomics

physical
cognitive
psychic
social
cultural
emotional
Human



Technology technical system build environment workplace machine tool accessory	Organisation work system work organization jobs tasks work methods actions
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Examples of well-being results

Survey 130 EurErg ergonomists

- more comfort (3.5)
- better work satisfaction (3.4)
- reduced physical workload (3.3)
- Improved worker health (3.3)
- improved motivation (3.3)
- less pain and complaints (3.2)
- improved safety (3.2)
- reduced mental workload (3.0)
- less injuries (2.9)

1= never, 2= seldom, 3= sometimes, 4= regularly, 5= always

Breedveld, P., Dul, J. (2005). The position and success of certified European ergonomists Rotterdam: RSM Erasmus University

Examples *total system performance* results

- reduced human and system errors (3.1)
- increased productivity (3.1)
- increased product quality (3.0)
- increased flexibility (2.9)
- increased innovativeness (2.9)
- decrease in lost work time (2.9)
- high returns on investment (2.8)
- reduced sick leave (2.7)
- reduced injury costs (2.7)
- cycle time reductions (2.5)
- drop in labor turnover (2.3)

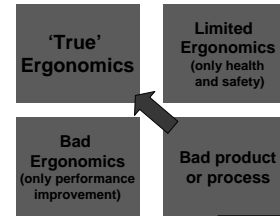
Breedveld and Dul (2005).

Ergonomics

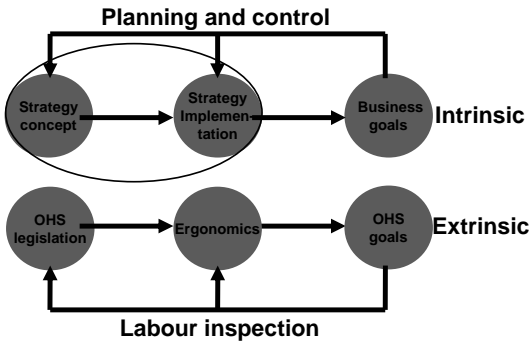
Overall system performance

YES € NO

Well being
♥ YES
NO



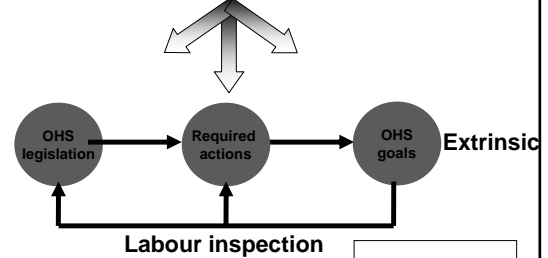
Ergonomics as sideline



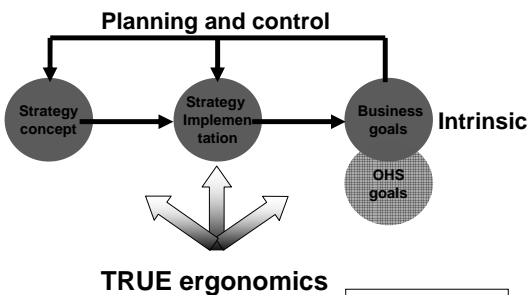
Dul, J., Neumann, W.P. (2005). Ergonomics contributions to company strategies. In: Proceedings of the 10th International Conference on Human Aspects of Advanced Manufacturing: Agility and Hybrid Automation. San Diego, USA

OLD contribution of ergonomics

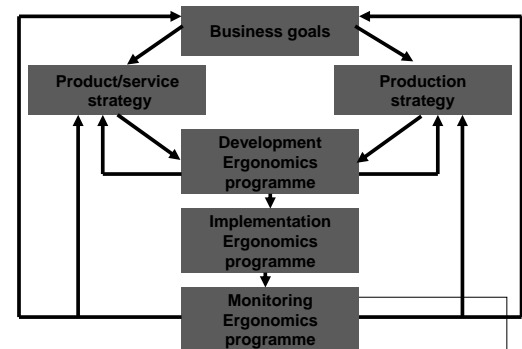
LIMITED ergonomics



NEW contribution of ergonomics



Integration of ergonomics





Statement 3

The business world will appreciate ergonomics more, if we offer business value (refer to the definition of ergonomics about “overall system performance”)

Conclusion 1

We can strengthen the business value of ergonomics

By improving:

1. our identity (how we are)
2. our image (how others see us)

Conclusion 2

Strengthening our identity: More attention to overall system performance (frame of thinking/doing):

Education:

- ergonomists, OHS professionals

Practice:

- ergonomics contributions to business issues

Research:

- measure/report also performance outcomes

Conclusion 3

Strengthening the image: More and better communication with business people (frame of wording):

Education:

- managers, management consultants

Practice:

- speak to (top)managers and other business decision makers

Research:

- publication in management journals

Volvo chief ergonomist:

“The ergonomics work is not a separate entity, but is based on the strategy. It was much easier to get the managers and other employees to understand, realize, accept and become involved in ergonomics work when they saw the link with the (...) strategy”

Munck-Ulfst t, U., A. Falck, A. Forsberg, C. Dahlin, and A. Eriksson, Corporate ergonomics program at Volvo Car Corporation. Applied Ergonomics, 2003, 34; p. 17-22.