

Workshop Report: Ergonomics' Contributions to Company Strategies

W.P. Neumann¹, J. Dul²

1 - National Institute for Working Life, Box 8850, SE-402 72 Göteborg, Sweden

patrick.neumann@niwl.se

2 – RSM Erasmus University, P.O. Box 1738 / 3000 DR Rotterdam / The Netherlands

jdul@rsm.nl

This paper reports on the results of a workshop held at an international conference, on the potential for ergonomics to contribute to the strategic goals of an organisation. Important issues raised by participants were: including the role of different business functions, the organisation's context, the interaction of ergonomics with different business strategies, factors influencing the process of uptake of ergonomics, and the problem of lack of knowledge amongst engineers, managers and ergonomists. Results were generally supportive of the thesis that ergonomics can contribute to an organisation's strategic goals beyond an exclusively health and safety focus.

Keywords: ergonomics, company strategy, competitiveness, paradigm shift, workshop

1. Background and aim.

This paper reports on the results of a workshop held at the 10th International conference on human aspects of advanced manufacturing: agility and hybrid automation (HAAMAHA 2005, San Diego). At this conference the authors presented a keynote address considering how ergonomics can contribute to companies' strategic objectives (Dul and Neumann, 2005) and organized a special workshop on this topic (Neumann and Dul, 2005). This paper briefly summarises the arguments in the HAAMAHA keynote, reports on key issues that emerged from the workshop, and attempts to extend the debate on how ergonomics can contribute to corporate strategy.

2. Ergonomics and Company Strategy

The International Ergonomics Association (IEA) describes ergonomics (or human factors) as contributing to the optimisation of both human well-being (a social goal) and total system performance (an economic goal) (IEA Council, 2000). Most ergonomics research and advice primarily deals with the well-being goal of ergonomics, in particular the prevention of musculoskeletal disorders.

Furthermore, in several countries ergonomics is closely linked to occupational health and safety legislation. The current trend in western governmental policies to reduce command-control legislation and to increase support for voluntary initiatives is a threat for ergonomics because we do not believe

that organizations will then spontaneously start ergonomic initiatives. Expecting that health focussed ergonomics will be a voluntary initiative of industry is not realistic: we consider this 'dream ergonomics'.

We suggest a new direction for ergonomics, using its full potential in organizations, without being dependent on health and safety legislation. We consider 'strategy' and 'business goals' as useful connection point to internalize ergonomics in organizations, because strategy has top management priority and is normally intended to be broadly communicated and implemented in the organization. Several 'strategic arenas' could be a starting point for applying

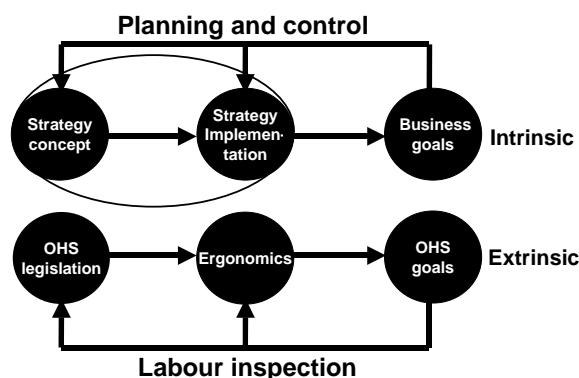


Figure 1: Model illustrating how ergonomics exists as a separate organizational stream driven by legislation requirements

ergonomics, with each strategic arena representing a different set of stakeholders that might benefit from ergonomics:

- 1) Corporate Strategy (top management, shareholder);
- 2) Business Function Strategies (business function managers, professionals, and employees;
- 3) Cross-functional strategies (several business function managers, professions, and employees.)

Figures 1 - 3 represents our views. Figure 1 shows that when ergonomics is solely based on a occupational health and safety (OHS) paradigm it will be extrinsic and not be part of the intrinsic motivated and central planning and control cycles in an organization. Figure 2 shows the need to explicitly understand the ergonomics' connections to business' strategic concepts, strategy implementation processes, and business goals (in different strategic arenas). Figure 3 illustrates the final goal: ergonomics is embedded in the organization, as part of the strategy to realize business goals. Ergonomics is not a strategy or business goal in itself: ergonomics supports company strategy. Under these circumstances, ergonomics is used in its full potential as suggested in the IEA definition.

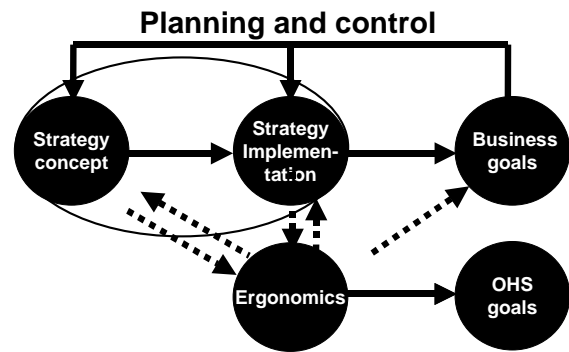


Figure 2: We need to understand the ergonomics-strategy relationships.

3. The Workshop

The workshop was attended by 12 conference participants (see acknowledgements) and included both researchers and practitioners with ergonomics, engineering and business administration educational backgrounds. The workshop consisted of a brief introduction (summarised above), in which the main points of the keynote presentation were reviewed, followed by a 2 hour 'open forum' round-table discussion in which participants were encouraged to discuss aspects of the topic they felt were most relevant. Both the authors, as well as two 'volunteers' amongst the participants took notes.

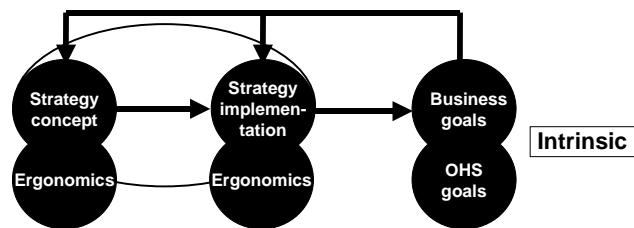


Figure 3: If integrated, ergonomics can contribute to both business and OHS goals.

4. Workshop Results

Participants mentioned 4 important **business functions** relevant to the thesis: finance, marketing, human resources (HR), and operations. Of these operations was seen as the most critical to reach since it is here that influence over the work system, and therefore ergonomics is highest. While some participants questioned the utility of work environment as a marketing strategy, examples of 'best practices' awards for good workplaces exist and, in Denmark for example, work environment ratings are made public and can thus influence a company's image. A challenge to such efforts is a reliable 'certification' process that could verify, or even score, a company's production processes. The Red Stripe beer company provided an example of having used work environment as part of their advertising campaigns in conjunction with a broader corporate social responsibility (CSR) agenda. There was a call for more evidence that application of ergonomics principles can provide financial, and not just health, benefits to the company. Finally, HR was not seen as commonly connected to ergonomics, although a number of examples exist of companies taking a broader interest in their employee's wellbeing. Ergonomics could support the notion that employees are the 'intangible assets' of the company.

Company context was seen as important in terms of its uptake of ergonomics. Wealthy companies with long-term perspectives might be more likely to include ergonomics as part of its social strategic thinking. Companies operating in a survival mode, with a short term focus, may not see the social goal of ergonomics as a critical aspect – the company must satisfy its business goals even though it may want to satisfy its social goals. Companies with high investment intensity (very expensive systems)

may have more problems adopting ergonomics due to the 'rigidity' caused the high cost of change. The 'time horizon' of manager decision-making will change with the company context – the nature of managers' decision making will influence their perception of ergonomics. Company size was also seen as important: while large companies can afford specialists to help comply with occupational health and safety (OHS) regulations (and perhaps reap other benefits from ergonomics over time), smaller companies may have no idea how to begin incorporating ergonomics into their development processes. Once in the organisation, the ergonomist can also give attention to the economic goal of ergonomics.

A number of **corporate strategies** and their ergonomics connection were identified over the course of the workshop. Firstly ergonomics was seen as easier to 'sell' to companies that had a strategic philosophy that included employee well-being. Similarly CSR agendas, previously mentioned, can provide support to the ergonomics agenda. 'Lean manufacturing' was discussed as two sided: while operator participation is critical the work itself often remains Tayloristic. Participants noted a trend in continuous improvement processes (a 'lean' component) to focus on both quality and ergonomics in the improvement process. This parallels a trend towards the integration of management systems such as ISO 9000 (quality), ISO 14001 (environment), and OHSAS 18001 (work environment). This integration, and particularly the links between ergonomics and quality, may support a more natural and effective application of ergonomics in future development processes. Downsizing strategies were noted as problematic since the ergonomist may be 'downsized' early as the company tries to 'focus on the essentials'. Finally benchmarking approaches were seen as a possible strategy that could help motivate companies to improve their own utilisation of ergonomics.

The **adoption process** by which a company might take up ergonomics emerged as a thread in the workshop discussions. How, participants asked, should ergonomics 'grow' or evolve in the company? Can we learn from the successes of the quality movement? Some participants were sceptical that ergonomics could come from a strictly bottom up approach – management support is needed. Obtaining such support may need some kind of 'ergonomics champion' inside the organisation, especially at senior levels. Unfortunately, managers at these levels are mostly accountants, lawyers or engineers with little understanding of ergonomics. The group also made several observations with regards to ergonomics uptake. A newly hired manager had imported ergonomics thinking into her new companies processes. Companies had been seen to adopt ergonomics only to the extent required by OHS law – nothing more. Participants generally agreed that ergonomics should be included in the long term planning of the organisation and that integration at all levels of the organisation was needed – although there is a need for tools that would support consideration of ergonomics in decision-making. An intervention strategy was discussed which started by examining a companies' mission statement and long-term business plan to identify how ergonomics could contribute to the company reaching its goals. In this way ergonomics could move beyond its legislated OHS 'pigeonhole' to achieve higher levels of application in the organisation.

Knowledge and training were mentioned as potentially important factors for ergonomics adoption. The extent to which engineers receive training in ergonomics appears to vary across countries with many engineers receiving almost no education on ergonomics. While design for ergonomics (DfE) approaches have been developed they are not widely known or understood in the engineering community. Management training programs generally provide no education in ergonomics – which almost certainly influences the manager's decision making with regards to application of ergonomics in their organisation. Similarly ergonomists seem to be receiving little training in engineering and management, which can also hamper the integration of ergonomics into engineering design processes and management decision-making. A Danish research project was cited to provide a cautionary note on ergonomics education for engineers: if the organisation does not expect the application of ergonomics, then the expertise of the ergonomically trained staff will not be used. Here again, context plays a role in determining the extent to which knowledge might be applied inside the organisation. Employee's knowledge also represents a part of the company's 'intangible assets' or 'business intelligence' that can play a vital role in adapting to continuously changing market conditions. While case studies are lacking, ergonomics was seen to have potential in retaining valuable personnel who can contribute knowledgeably to an organisations development.

5. Discussion & Research Priorities

While the workshop participants appeared to generally agree with the thesis presented, it is possible that deeper reservations were not raised in this context. There remains a sense that ergonomics is a health issue and supports companies' social objectives and can be driven by the creation of local (national) legislation. While we don't discount the need for legislation (in particular when no economic benefits can be expected), we see great potential for ergonomics to contribute to organisations' core (economic) goals while also furthering social (health) goals, as supported by examples given in the keynote lecture (Dul and Neumann 2005). Seeing ergonomics as contributing to organisational goals makes it much easier to achieve successful implementation. This requires a paradigm shift and a change in thinking about what 'ergonomics' is (more than just a health issue) and represents (a potential contributor to strategic goals) for the company.

From discussions in this workshop the following research priorities were identified:

- Good case studies demonstrating the link between ergonomics performance and system performance at organisational, production system and workstation levels.
- Development of an 'Ergonomic Index' allowing judgement at the organisation's level (for possible awards) and potentially certified similarly to ISO9000.
- Studies of how customers respond to (process) ergonomics as a marketing tool.
- Studies of managerial decision-making processes with regards to ergonomics.
- Practical studies illustrating how ergonomics can be integrated into a company's design and development processes. What barriers and facilitators influence such efforts?
- Studies of relationships between motivation and job satisfaction, traditionally attended to by managers and strategists, and ergonomics measures from the workplace.
- Broad surveys examining how companies are currently handling ergonomics in their operations, as well as the engineers' and managers' perception of, and are trained in, ergonomics.

By paying closer attention to the performance aspects of ergonomics, and to the strategic needs of their client organisations, ergonomists may be able to open new doors and avenues of application and thereby improve the effectiveness of ergonomics in the design of work systems that are both humanly sustainable and economically productive.

Participants recommended that further workshops in this topic use a '2-stage' approach to allow participants more time to consider the proposition. The need to engage the management community in such discussions was also mentioned as a priority.


6. Acknowledgements

This work has been supported by the SMARTA theme of the Swedish National Institute for Working Life and the Erasmus Research Institute of Management of the Erasmus University Rotterdam. We are thankful for the workshop participants who included: Mark Boocock, Tony Vitalis, Stefano Marzani, Arne Bilberg, Anabella Simoes, Pedro Ferreira, Damian Graham, Canan Ceylan, Ole Broberg, Roberto Montanari, Enda Fallon, Reem Aekadeem.

7. References

- Dul, J. and Neumann, W. P. (2005) *Ergonomics contributions to company strategies* in 10th International conference on human aspects of advanced manufacturing: agility and hybrid automation (HAAMAH 2005), San Diego, USA,
- IEA Council (2000) In *The Discipline of Ergonomics* International Ergonomics Society.
<http://www.iea.cc/ergonomics/>
- Neumann, W. P. and Dul, J. (2005) *WORKSHOP: The Strategy - Ergonomics relationship: Exploring and combining available knowledge to improve performance* in Human aspects of advanced manufacturing: Agility and Hybrid Automation, San Diego, USA.







WORKSHOP REPORT

Ergonomics' Contributions to Company Strategies

W. Patrick Neumann www.ali.se
Jan Dul www.rsm.nl

RSM  **ERASMUS UNIVERSITY**












HAAMAHA 2005 Workshop










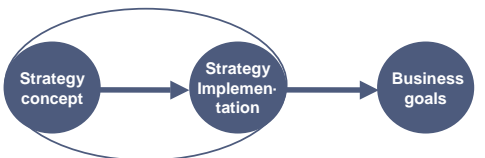
WORKSHOP AIMS

to help close the gap between corporate strategic development and the application of human factors for better organisational performance and better working life.




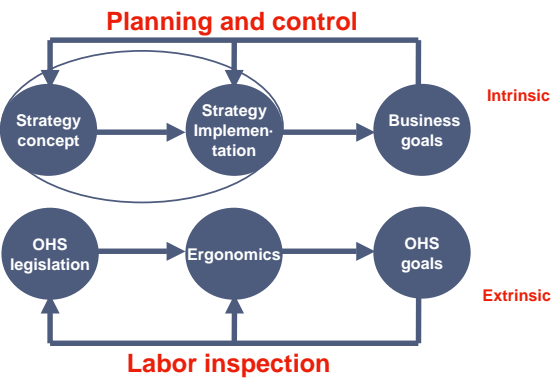





Keynote: Ergonomics & Strategy



Dul, J. and Neumann, W. P. (2005) *Ergonomics contributions to company strategies* (HAAMAH 2005), San Diego





Planning and control (top path)
Labor inspection (bottom path)

Intrinsic (top row)
Extrinsic (bottom row)

Dul, J. and Neumann, W. P. (2005) SIDE-CAR Ergonomics






Strategy arenas

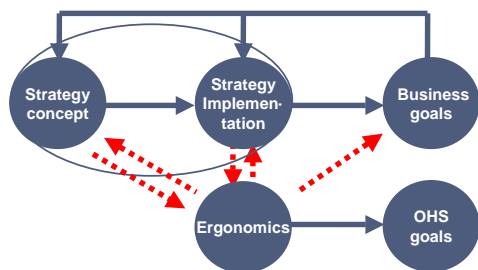
1. Corporate strategies (e.g. cost leader)
2. Business function strategies (e.g. Production, HRM)
3. Cross-functional strategies (e.g. TQM, BPR)

Different:

- stakeholders
- approaches
- performance criteria



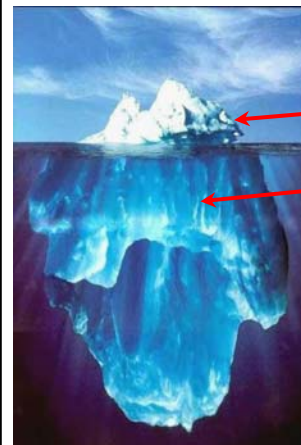
Step 1: building relationships



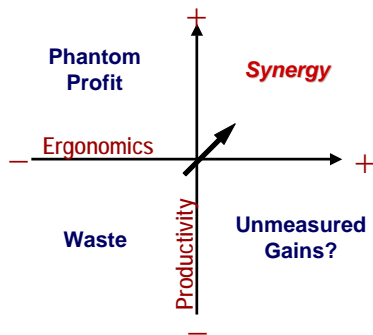
Dul, J. and Neumann, W. P. (2005)

Ergonomics Gains:

- Sickness/absence
- Productivity
- Lead Time
- Delivery precision
- Quality
- Flexibility



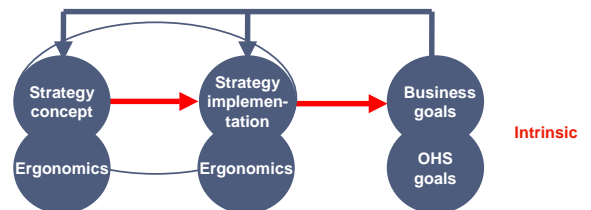
Navigational Objective



OK



Step 2: Embedding



- Ergonomics:**
- Not a sideline based on OHS legislation
 - Not in itself a strategy – but an important feature of strategy

Dul, J. and Neumann, W. P. (2005)

HAAMAHA 2005 Workshop



Workshop Structure

- 12 participants (HAAMAHA)
 - Ergonomics & engineering
 - Practitioners & Researchers
- Concept Summary (after Keynote)
- 2 hour 'round-table' discussion
- Notes taken in session (2 + 2), collated and condensed
- Results confirmed with participants





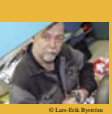
Results: Business Functions

- 1. Finance**
 - Need more evidence
- 2. Marketing**
 - Best practices & WE awards (*method?*)
 - CSR marketing approach (Red Stripe)
- 3. Human Resources**
 - Not commonly connected to ergo (!?)
- 4. Operations** -> most important




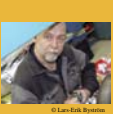

Results: Company Context

- **Wealthy Orgs** – longer term focus
- **Survival mode** – not time for social goals
- **High Investment intensity** -> process rigidity (low latitude)
- **Size** – Small corps lack knowledge & approach


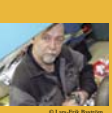
Results: Corporate Strategies

- Ergo easy sell if **consistent with org strategy** w.r.t. Employee well being
- **'Lean'** – both Tayloristic & with potential to integrate ergo in CI work
- Management system integration (9000 + 14000 +...)
- **'Downsizing'** – may lose ergonomist
- **'Benchmarking'** – good potential to motivate orgs in dealing with ergonomics


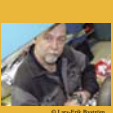
Results: Adoption Process

- How to 'grow' (or install) ergonomics?
- Can quality movement teach us?
- Need an internal champion
- New hires have potential to bring new ideas
- Legislation creates a barrier to excellence
- **Why not start with examination of mission statements and business plans to find Ergo relations?**
- **NEED** tools to support HF in Decision-Making


Results: Knowledge and Training





- How are **engineers** trained in Ergo?
- How are **ergonomists** trained in Engineering?
- How **MBA's** understand HF?
- **A critical element – although training alone is not enough: need org support.**
- People knowledge is part of a companies intangible assets...

Discussion: Research Priorities






- **Case studies** linking HF & (org., system, workstation level) performance
- Need Org. **Audit framework** (towards ISO-type verifiability)
- How do **Customers & Investors** perceive Work Environment?
- How to **Integrate HF into design processes?**
- Relationships between **HF & motivation** / job satisfaction?
- How is **HF now managed** by companies? (survey)




Reflection

- Ergonomists appear to agree that ergonomics can contribute to organisations strategic goals
- Erg's are not used to such an approach
- Tendency to look to health-legislation to support ergonomics implementation
- Have we been TOO SUCCESSFUL in marketing ergonomics as a health measure?

Next Steps

- Expand discussion in Ergonomics community (IEA 2006)
- Initiate discussions with management (research & practitioner workshops)
- Initiate Research based on priority list







Workshop participants

- Mark Boocock
- Tony Vitalis,
- Stefano Marzani,
- Arne Bilberg,
- Anabella Simoes,
- Pedro Ferreira,
- Damian Graham,
- Canan Ceylan,
- Ole Broberg,
- Roberto Montanari,
- Enda Fallon,
- Reem Aekadeem.







STRATEGY is a slippery term

Strategy as:

1. Plan (*design, forward looking*)
2. Pattern (*emergent, development*)
3. Position (*market position*)
4. Pose (*"fake" position*)
5. Philosophy (*moral position*)

Mintzberg

