The value of system-oriented ergonomics in supporting healthy workplaces

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Agenda

What does ‘systems ergonomics’ mean?

- Optimum systems performance and worker well-being
- Healthy workplaces and TWH: a necessary paradigm shift
- ‘Systems ergonomics’ framework and approach

What ‘systems ergonomics’ can offer?

- Workers engagement (participatory ergonomics)
- Optimum work design for ALL
- Problem-solving approach at the organization level

Background & some common myths

- Low recognition of ergonomics/human factors as a systems discipline
- The social value of ergonomics (and systems ergonomics) has not been well understood (nor discussed) by H&S practitioners, employers, employees and costumers
- Despite the moral and ethical arguments for ergonomics programs, they are not always cost-effective
- There are many "good intention" programs that fail to …
  - integrate their goals with existing management systems needs and reality
  - recognize workers' voices and their needs
  - utilize a data-driven approach that is strategic in nature to ensure sound H&S policies and processes

Human Factors/Ergonomics definition

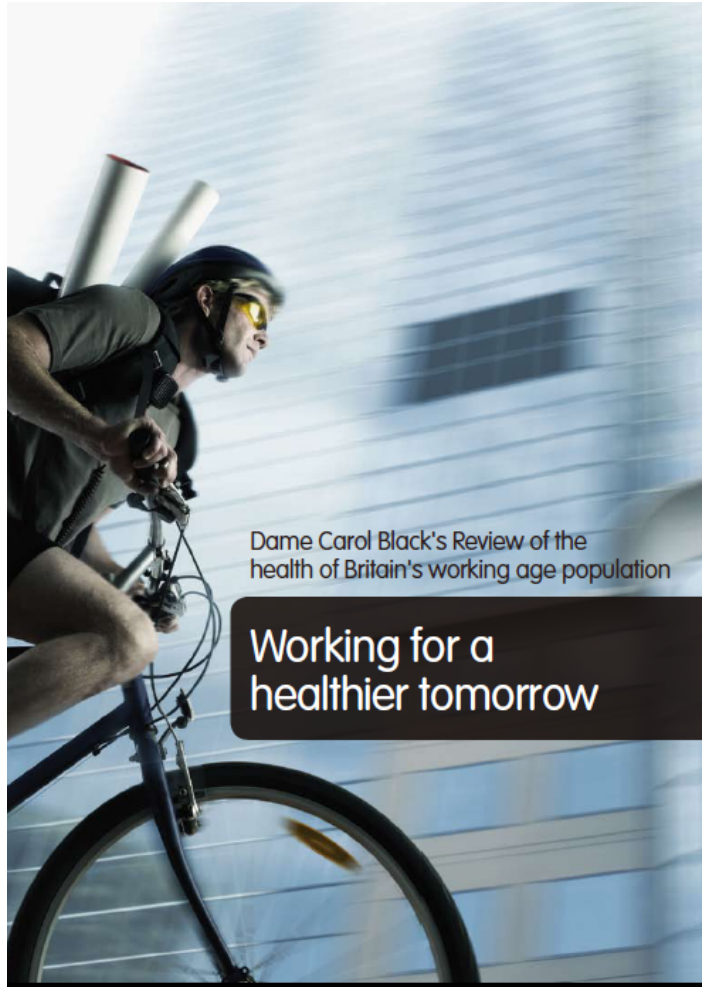
"The scientific discipline concerned with the **interactions** among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize **human wellbeing** and overall **system performance**"

Source: International Ergonomics Association 2000

Why the focus on worker well-being?

- "The experience of positive perceptions and the presence of constructive conditions at work and beyond, that enables workers to thrive and achieve their full potential"
- Importance of building resilience of individuals and communities
  - United Nations SDG 3 and 8: global 'social value' charter for the entire planet
  - Workers well-being and organizational performance are deeply interconnected

The 21st century workplace: a paradigm shift?



- Shift from a disease-centered to an ability-centered approach
- Work-life balance: work can no longer be viewed as separate from personal life
- Absence of/from work is perceived as unhealthy (psychosocial issues)
- Health equity and diversity
- Gig economy and remote work
- Intergenerational workplace
- COVID-19 pandemic issues

Research evidence on psychosocial environment

Contributing factors for Musculoskeletal Disorders

Job dissatisfaction	Job-related Stress	Monotonous work	Perceived workload & time pressure
Lack of job/task control	Unsupportive manager & unresolved conflicts	Reactive OHS culture	Poor leadership commitment and trust issues

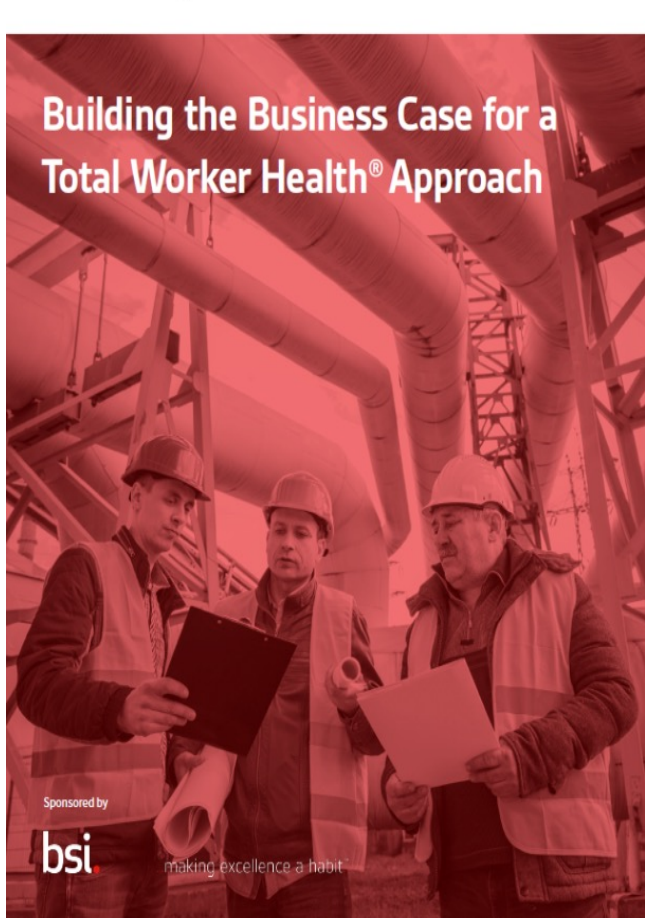
Why the focus on systems performance?

- When focusing on systems performance, the *human* dimension is at the center of the analysis and the most essential part of the system
- Many important work system deficiencies are identified. Examples:
  - Tasks must be compatible with peoples' expectations, limitations and training
  - Equipment must be safe and comfortable
  - Work organization must be non-discriminatory and recognize peoples' social and economic needs
- More integrated actions can be implemented

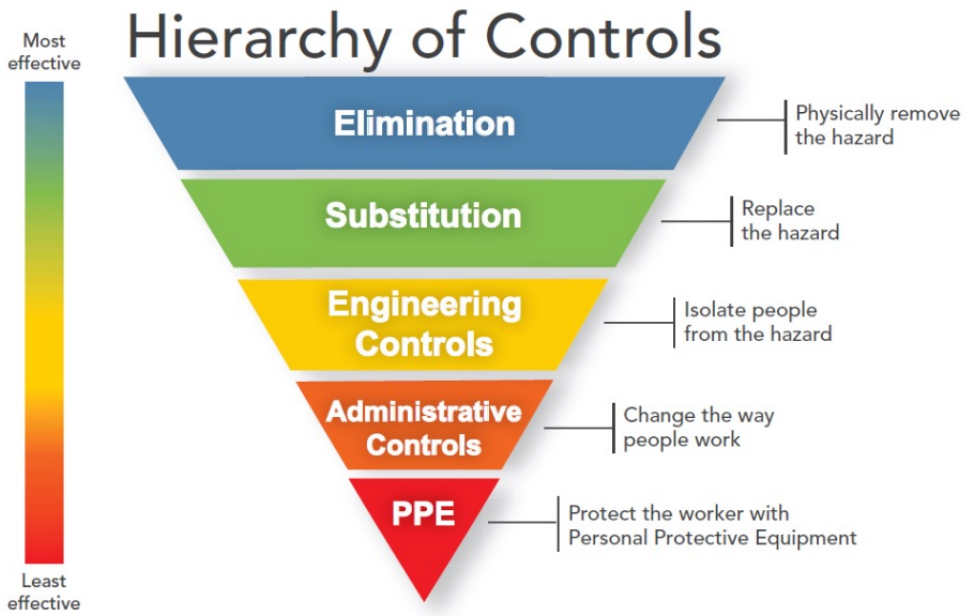
Towards more a proactive and well-integrated model

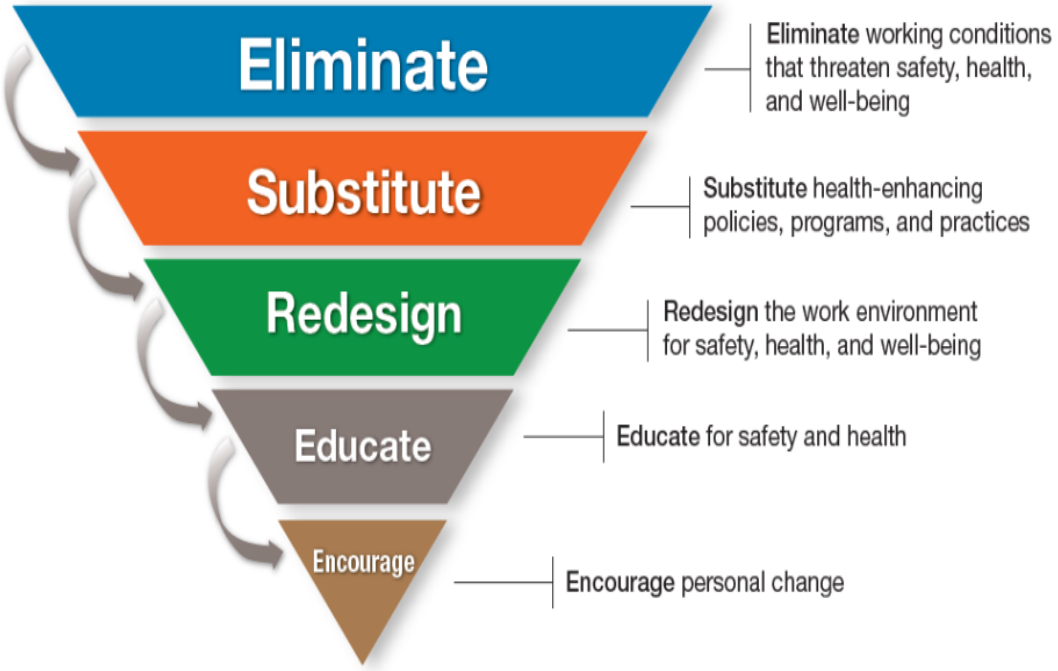
NIOSH-CDC Total Worker Health (TWH)

- Strategically integrates health protection with health promotion to prevent worker injury and illness and to advance health and well-being
- (Re) Design work/tasks to eliminate/reduce hazards and to promote well-being
- Cross-disciplinary and spanning departments



NIOSH Hierarchy of Controls applied to TWH





Actionable goals based on Hierarchy of Controls

TWH control measures

An integrated management system approach: ISO 45001:2018

- Prevents work-related injury and ill-health while providing specific guidance on how to improve performance and legal compliance
- Goes beyond accident prevention to create a healthier, more productive workforce (by **proactively** managing OHS risks)
- Provides a consistent framework across countries for safe healthy, and sustainable work in line with SDGs

TWH Key Principles

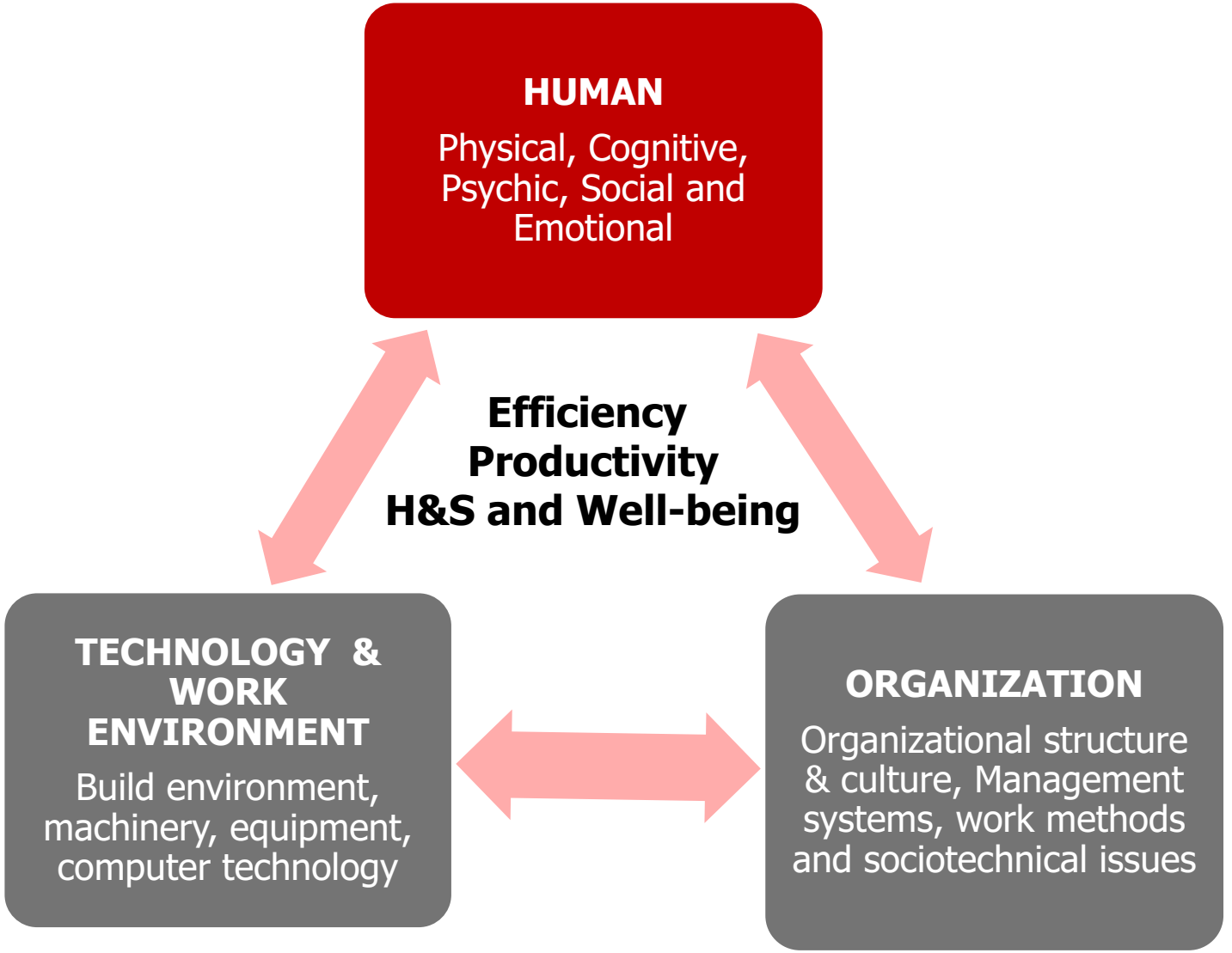
1. Leadership commitment*	2. Risk reduction* combined with health promotion	3. Worker engagement & consultation*	4. Confidentiality and privacy of workers	5. Integration of systems
• Greater emphasis on H&S climate improvement at the various leadership levels	• Work conditions and emerging health and wellbeing issues must be addressed	• Promote and support worker participation and consultation from all levels	• Prevent penalization of workers for their health conditions and needs	• Coordinating efforts for program and policy across divisions and departments (avoid silos)

**** Strong Similarities with ISO 45001 actionable-goals***

Main advantages of using ISO 45001 & TWH principles

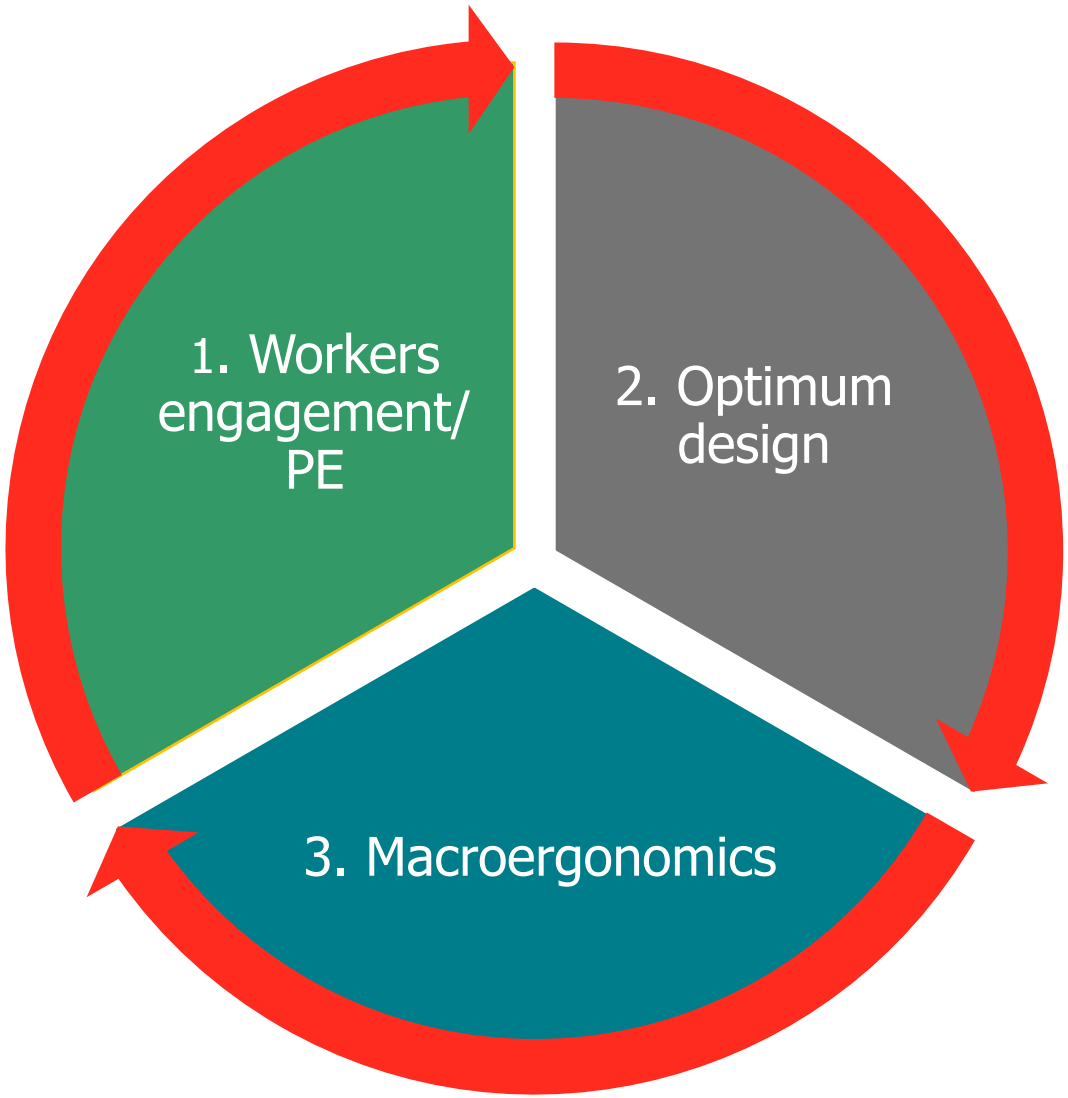
- Align well with OHS management systems' objectives
- Orient employers to engage the workforce on H & S and well-being issues
- Emphasize the need for leadership commitment
- Create a more proactive risk prevention culture through continual improvement
- Promotes integration of programs and policies across the organization (actionable goals)
- Global recognition side-by-side with United Nations' SDGs (ISO 45001 only)

Systems Ergonomics Practice Focus

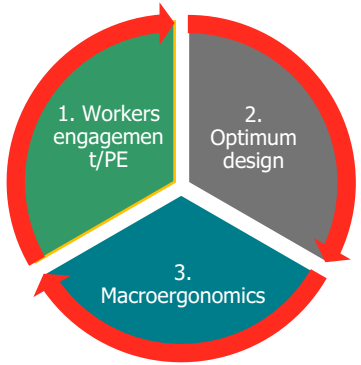


Systems ergonomics: 101

- Core principles may overlap)
- Application is limited to methods available
- Human-centred design in a sociotechnical context; i.e., subject to changes and not a "one size fits all" solution



1. The value of Participatory Ergonomics



- "End users" take an active role in the identification and analysis of ergonomic risks, as well as the design and implementation of solutions
- When implemented as "continuous improvement participation", organizational learning and culture develops with enhanced trust and better communication
- An opportunity to unravel systems' deficiencies from the broader view of ergonomics/human factors, including better work design for health and comfort as well as emerging psychosocial health issues

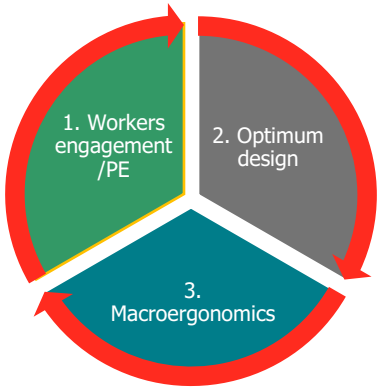
1. Example of practice: BSI Participatory Ergonomics

Phase 1 Weeks 1-4	Phase 2 Weeks 5-8	Phase 3 Weeks 8-12
• Awareness training to all employees • Task risk assessments • Begin solutions workshops • Implement easy fixes/ quick wins • Begin injury review panel	• Continue solutions workshops- additional tasks • Source and implement complex solutions • Progress check ins with department leaders	• Continue solutions workshops- additional tasks • Continue solution sourcing and implementation • Progress check ins with department leaders • Develop 'solutions catalog' for other sites • Transition planning and department coaching

1. How to ensure effective participation?

- Employees have to acknowledge the need for participation
- Employees have to trust that their participation will not have negative repercussions and that they will have some control over the final decisions
- Employees have to perceive that changes are being proposed and introduced in a legitimate way (full leadership support)
- Employees have to be given a real role to play in the introduction and implementation of changes

2. The value of optimum work design



Workplace layout improvements

- Improve workflow and concentration
- Engage different users
- Consider social relations
- Respect spatial boundaries and work groups
- Privacy and ability to control environment
- Help in reducing distractions
- Exposure to nature improves performance

2. Examples of practice

Active workplaces: Design for comfort and well-being

- Incorporate user work style
- Promotes movement
- Active workspaces: Intentional by design

Sit stand desks

- Alternate sit/stand times
- Improve mood, work performance
- Reduce MSD

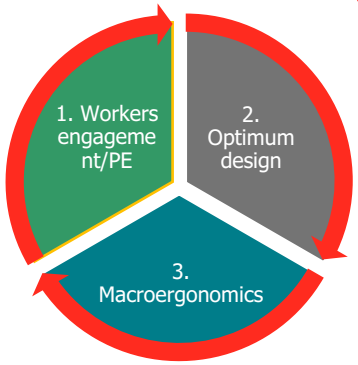
Physical activity breaks

- Increase energy expenditure
- Reduce general discomfort

Prompting Software

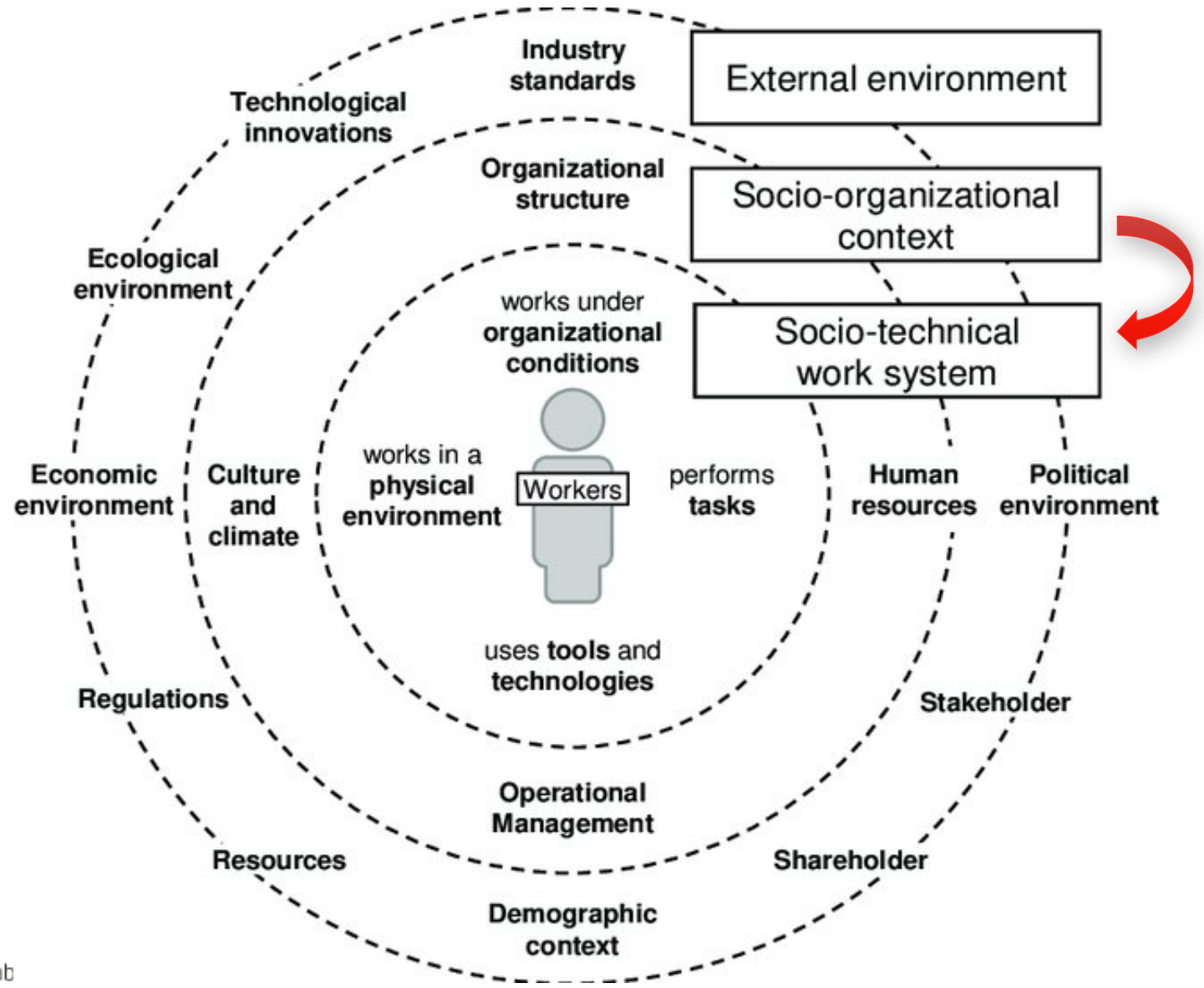
- Prompt employees to alternate between sit/stand postures and to take frequent breaks

3. The value of Macroergonomics



- It is human centered
- Identify the deficiencies in the technical and personnel subsystems using a humanized task approach in allocating functions and tasks (task design)
- It is both a top down and bottom up problem solving approach; therefore it usually involves extensive employee participation at all organizational levels
- It measures compatibility between people and their work, and the impact of a technological/organizational change

3. Levels of analysis



3. Some examples of macroergonomics methods

- **Macroergonomic Analysis of Structure (MAS)** - the organization structure is deeply analyzed by examining three major sociotechnical system elements: the technological subsystem, the personnel subsystem, and the relevant external environment
- **High Integration of Technology, Organization and People (HITOP)** - a step-by-step manual procedure for implementing technological change
- **Macroergonomic Analysis and Design (MEAD)** - a very systematic 10-step way of looking at the work system processes and how to improve them
- **Macroergonomic Organizational Questionnaire Survey (MOQS)** - collects information on various aspects of the work system: tasks, organizational conditions, environmental issues, tools and technologies, individual characteristics and various outcomes such as quality of working life, stress, mental health, work-related musculoskeletal disorders and attitudes (e.g., turnover intention)
- **Macroergonomic Compatibility Index (MCI)** - combines employee perceptions regarding the macroergonomic practices implemented in their companies (person, organization, technologies and tools, tasks, and environment) and how they align with best practices

3. Example of practice: BSI Ergonomics SWOT

- Initial understanding of management system across departments
  - Management commitment
  - Employee involvement
  - Process evaluation, documentation, and communication
  - Job analysis and surveillance
  - Implementation of solutions
  - Training and education
  - Medical management
- Facilitate deeper conversations about organization readiness and helps setting up actionable goals

Ergonomics SWOT

How well is your organization managing ergonomics risks?

Key element	Score				
	Not present	Fair, somewhat present	Good, present, but could be improved	Excellent, present and a strength	Overall score
Management commitment					
Is there a long-term vision and strategy on ergonomics?	0	1	2	3	
Is there a yearly ergonomics plan with measurable goals, defined resources, and budgets?	0	1	2	3	
Are responsibilities assigned and accountability metrics established?	0	1	2	3	
Is there a documented process that defines the purpose, goals, requirements, and responsibilities?	0	1	2	3	
				Section total	
Employee involvement					
Are employees informed about the ergonomics process and their responsibilities?	0	1	2	3	
Are employees aware of common WMSDs, how to identify and report early signs/symptoms and the importance of early reporting?	0	1	2	3	
Are there prompt responses to employee concerns and recommendations?	0	1	2	3	
Do employees have an opportunity to participate in the identification and mitigation of ergonomic hazards?	0	1	2	3	
				Section total	
Process evaluation, documentation, and communication					
Is there an annual review of process effectiveness and progress?	0	1	2	3	
Does the ergonomics program achieve its intended results?	0	1	2	3	
Are ergonomic improvements documented and communicated to employees and managers?	0	1	2	3	
Is there a benchmark of the company's progress against industry best practices?	0	1	2	3	
				Section total	
Job analysis and surveillance					
Are injury/illness records, employee surveys and other forms of data routinely used to identify ergonomic concerns?	0	1	2	3	
Have ergonomic risks been identified and prioritized?	0	1	2	3	
Have ergonomic evaluations been performed on all high and moderate risk jobs?	0	1	2	3	
Are appropriate tools and methods used to quantify ergonomic risk used consistently throughout the company?	0	1	2	3	
				Section total	

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EHS Services and Solutions

Application of systems ergonomics for TWH

- Systems analysis participatory ergonomics tool for designing integrated health and safety interventions (IDEAS)
- Developed by the Center for the Promotion of Health in the New England Workplace (CPH-NEW)

J Occup Environ Med. 2013 Dec;55(12 Suppl):S86-8. doi: 10.1097/JOM.0000000000000036.

The Intervention Design and Analysis Scorecard: A Planning Tool for Participatory Design of Integrated Health and Safety Interventions in the Workplace

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Abstract

Objective: As part of a Research-to-Practice Toolkit development effort by the Center for the Promotion of Health in the New England Workplace, to develop and test a structured participatory approach for engaging front-line employees in the design of integrated health protection and promotion interventions.

Methods: On the basis of a participatory ergonomics framework, the Intervention Design and Analysis Scorecard (IDEAS) provides a stepwise approach for developing intervention proposals, including root cause analysis and setting evaluation criteria such as scope, obstacles, and cost/benefit trade-offs. The IDEAS was tested at four diverse worksites with trained facilitators.

Results: Employees were able to develop and gain management support for integrated interventions at each worksite.

Conclusions: The IDEAS can be used effectively by front-line employees to plan integrated interventions in a program dedicated to continuous improvement of employee health protection/promotion and Total Worker Health.

Benefits beyond financial gains

For the employees

- Enhances morale
- Improves physical, psychological and social well-being
- Higher motivation, growth and job satisfaction
- Improves performance

For the organization

- Improves trust and communication
- Strengths company image
- Tackles emerging issues
- Supports organization resilience

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Questions?

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