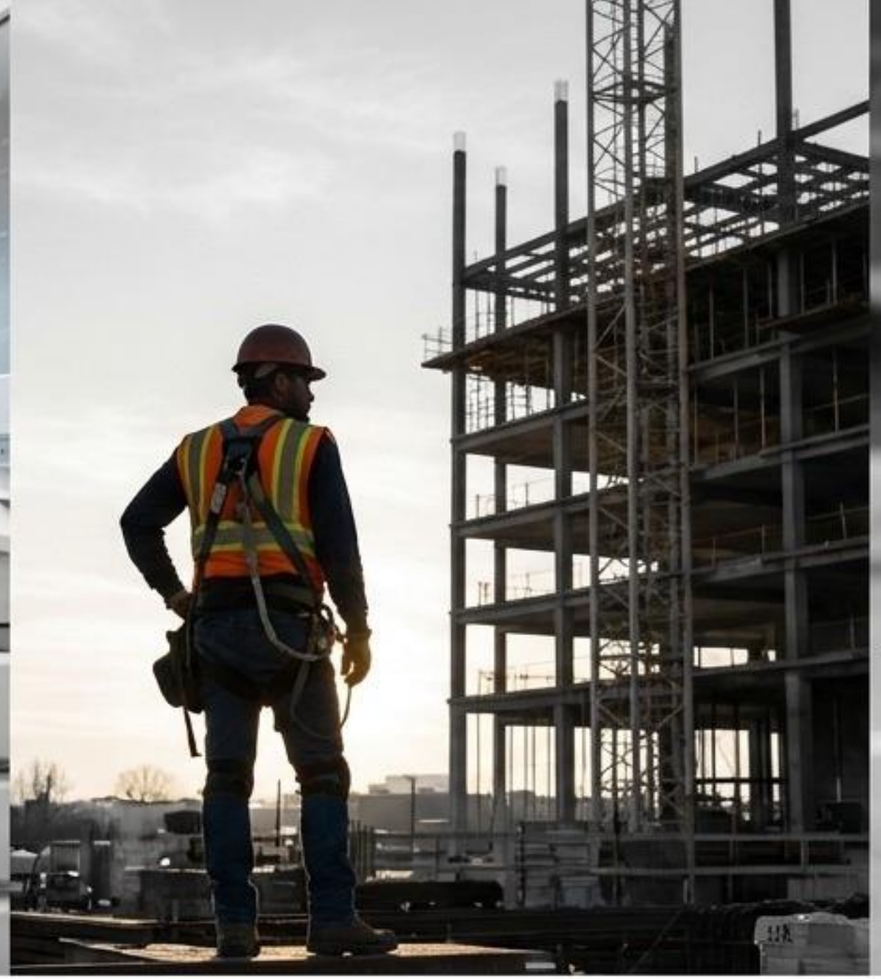



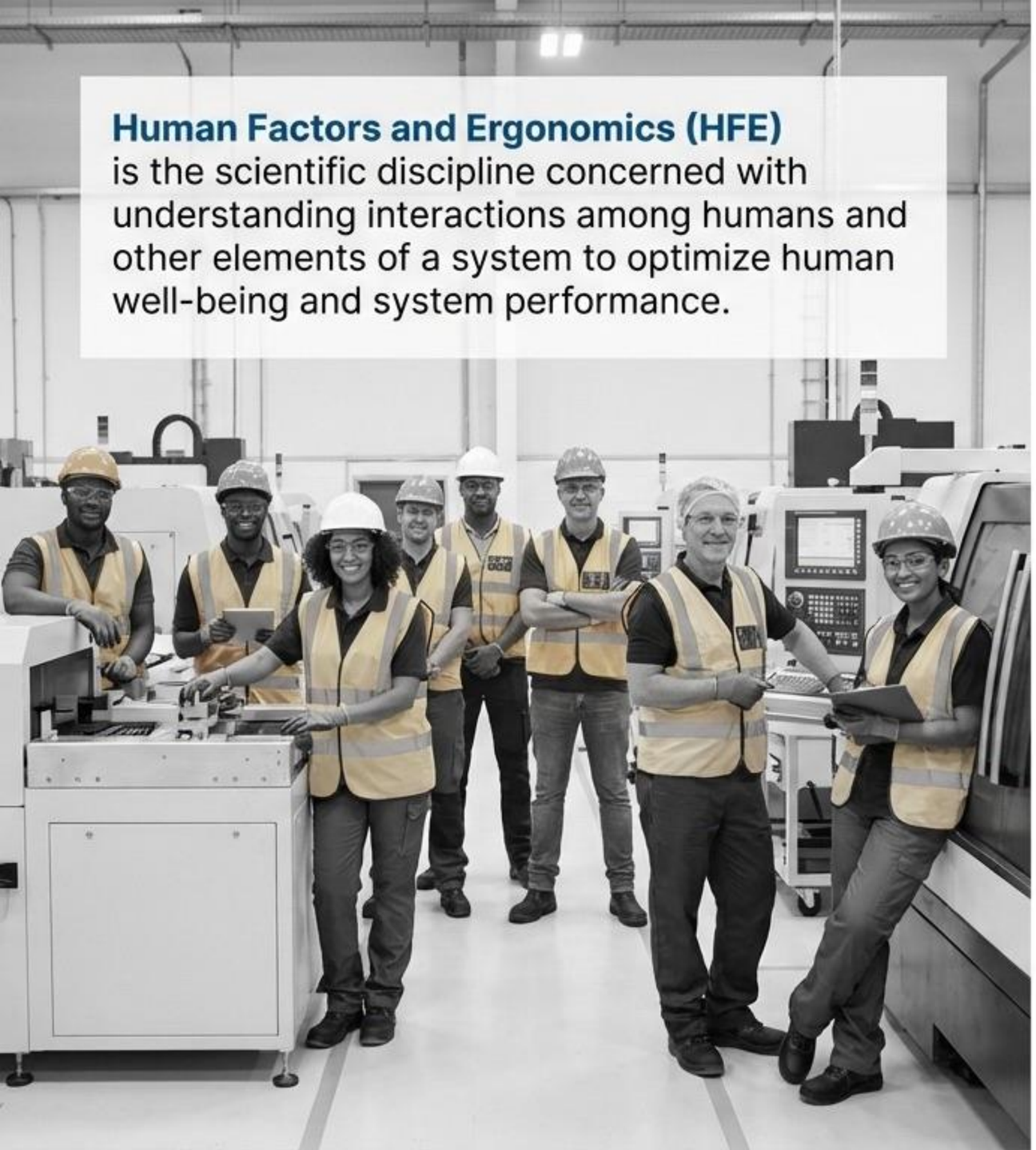

International Labeur Organization | IEA International Ergonomics & Human Factors Association

Human Factors & Ergonomics: A Framework for Decent Work

A Systems Approach to Improving Health, Safety, Wellbeing, and Performance

Review report by the International Ergonomics Association for the ILO

Core Writing Committee: Carisa Harris Adamson, PhD (Chair), Andrew Thatcher, PhD (IEA President), Klaus Bengler, PhD, Christopher Kelly, PhD, Wendy Macdonald, PhD, Shamsul Bahri Bin, PhD, Esa-Pekka Takala, MD, PhD, Chaoyi Zhao, PhD.



Human Factors and Ergonomics (HFE) is the scientific discipline concerned with understanding interactions among humans and other elements of a system to optimize human well-being and system performance.

Designing the System to Fit the Human

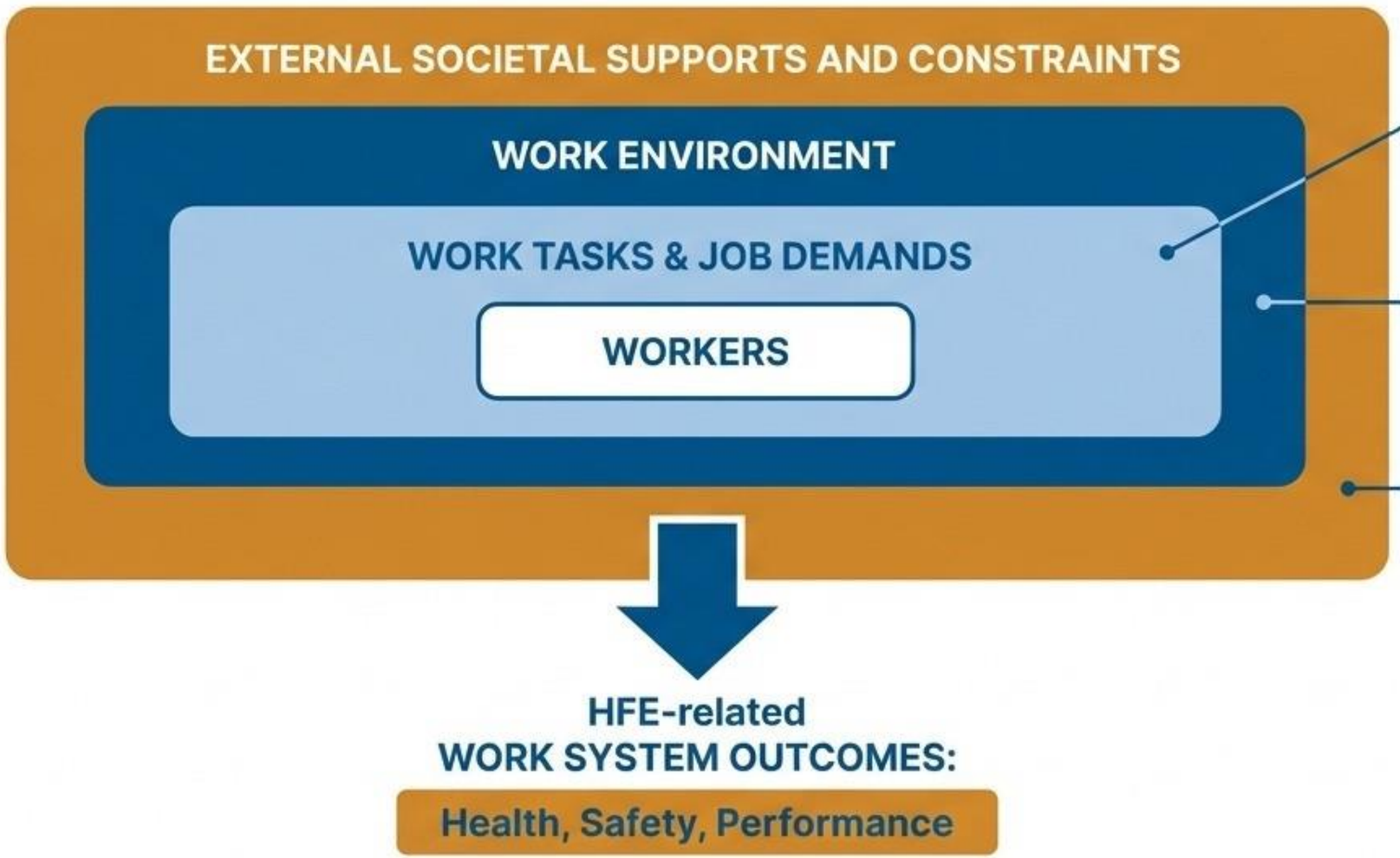
Dual Goal:
Ensure well-being belling
AND optimize performance.

Holistic View:
Performance results from interactions between humans and the system.

Design-Driven:
Design systems to fit human capabilities, not force humans to adapt.

HFE Applies a Systems Approach

We cannot fix the worker; we must fix the system.



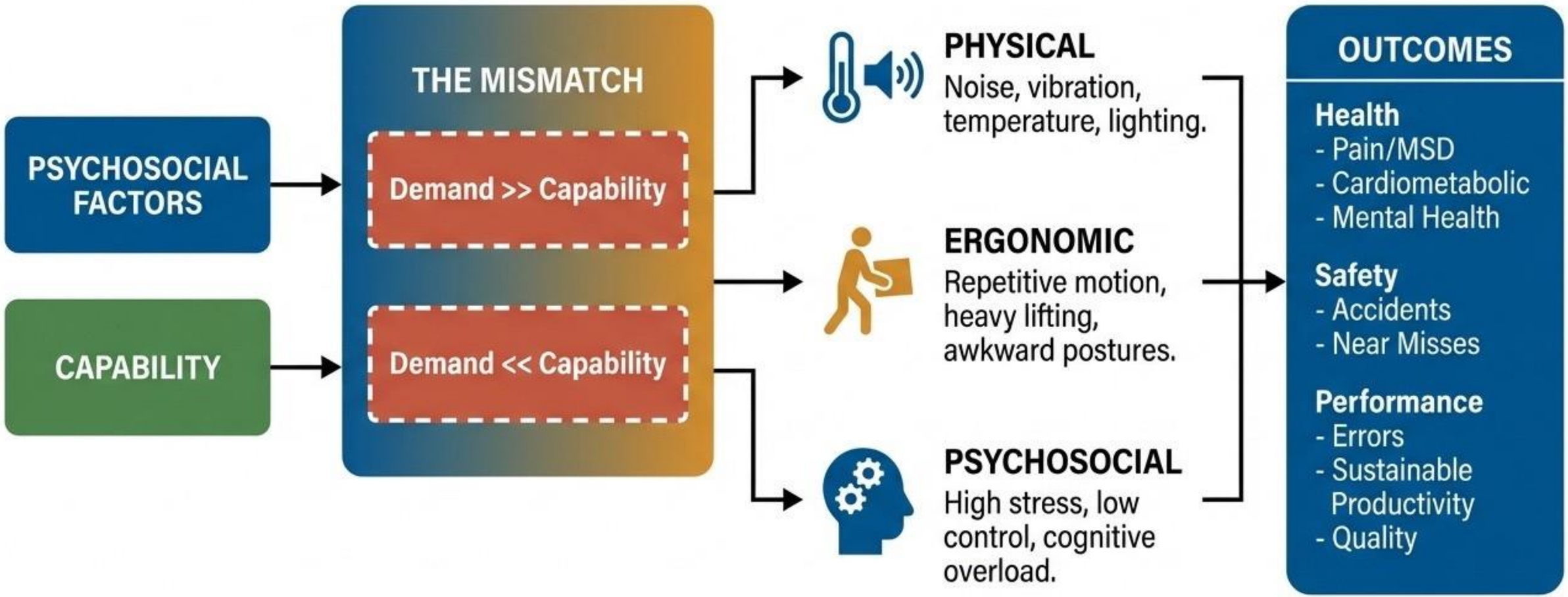
Micro Level: Individual interaction with tasks and tools.

Macro Level: Organization, physical environment, and culture.

External Factors: Legislation, social safety nets, and economy.

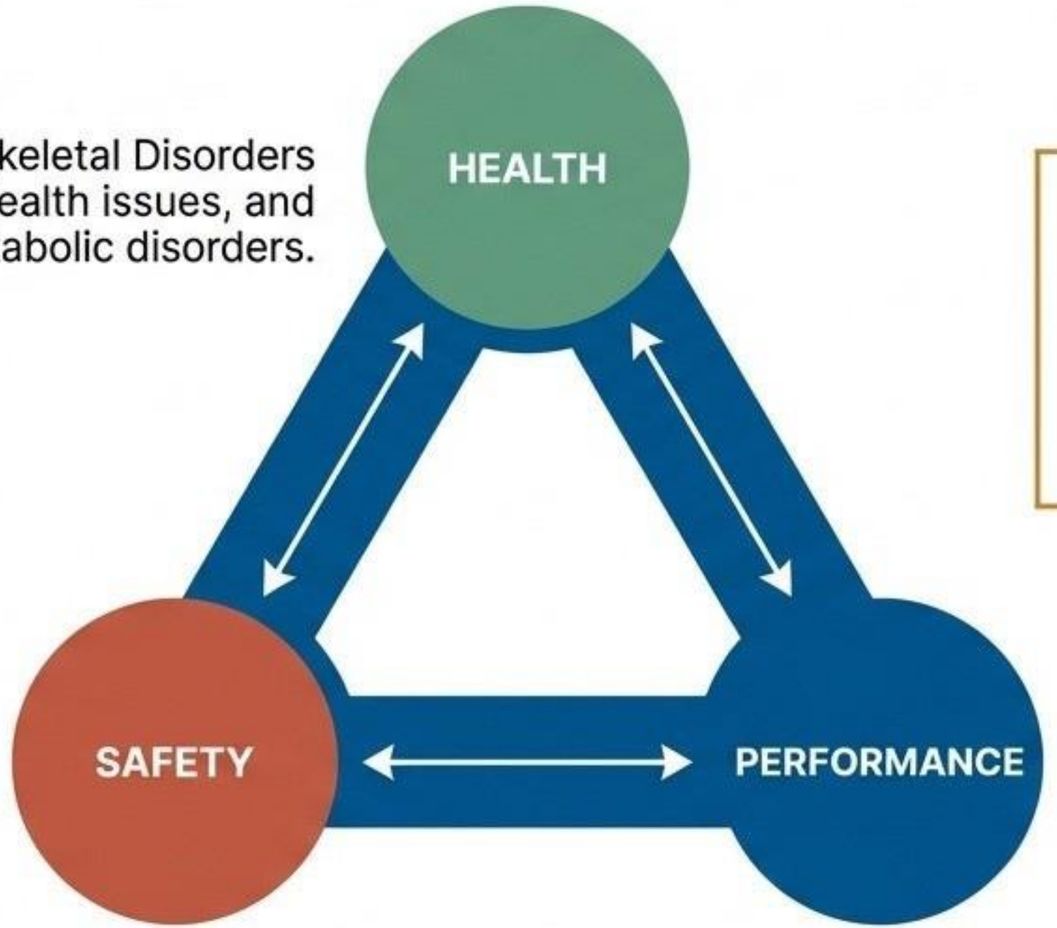
Human-Centric Design

Risk Occurs When Demands Exceed Capabilities



The Triple Aim: Health, Safety, and Performance

Reducing Musculoskeletal Disorders (MSDs), Mental Health issues, and Cardiometabolic disorders.



Insight: Low back pain is the single most significant cause of years lived with disability (YLDs) in most countries.

Preventing acute injuries, acute injuries, major accidents, and reducing human error.

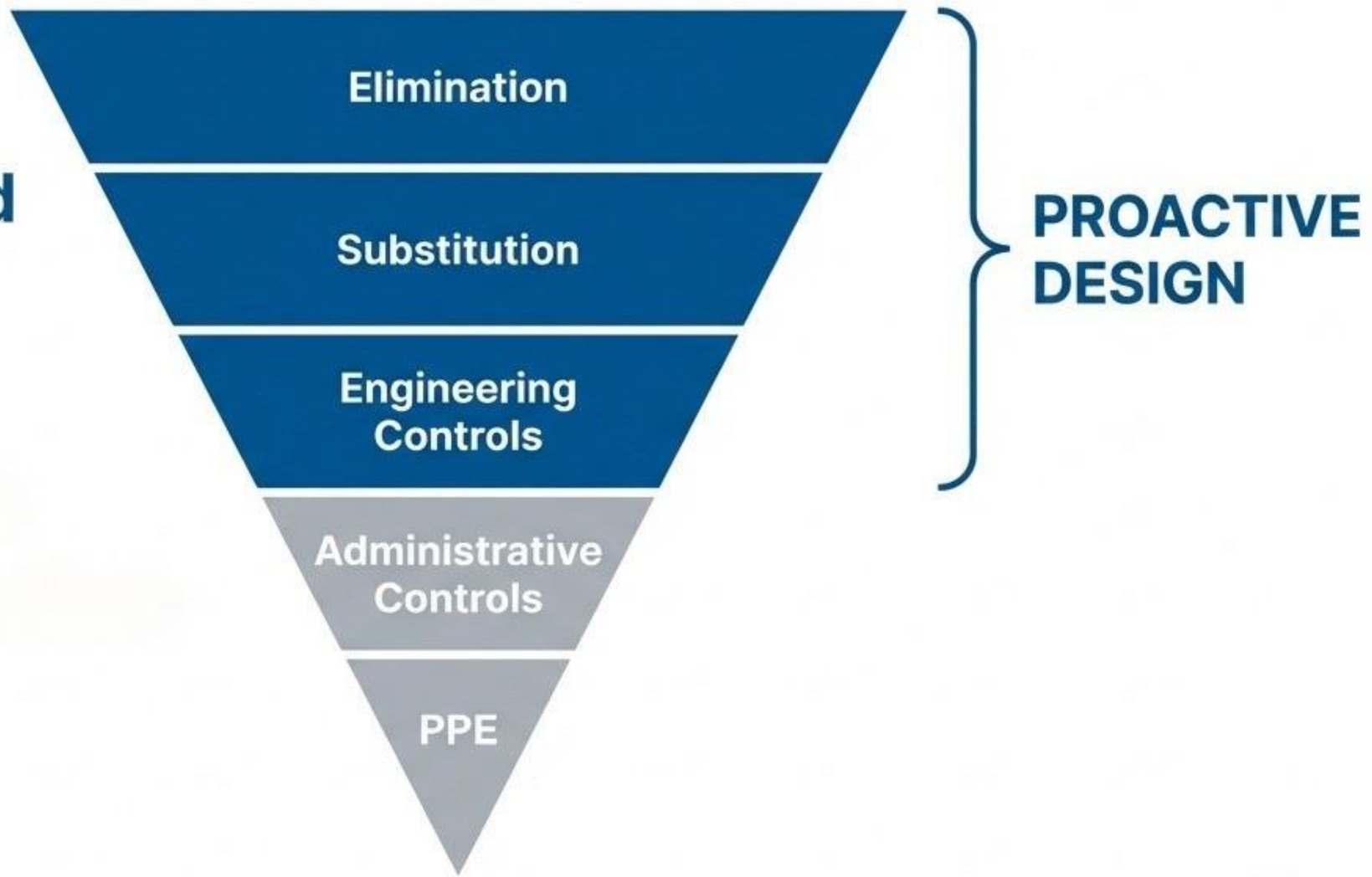
Enhancing quality, reducing errors, and achieving Sustainable Productivity.

The Strategy: Design to Fit

HFE prioritizes designing the hazard out of the system before it exists.

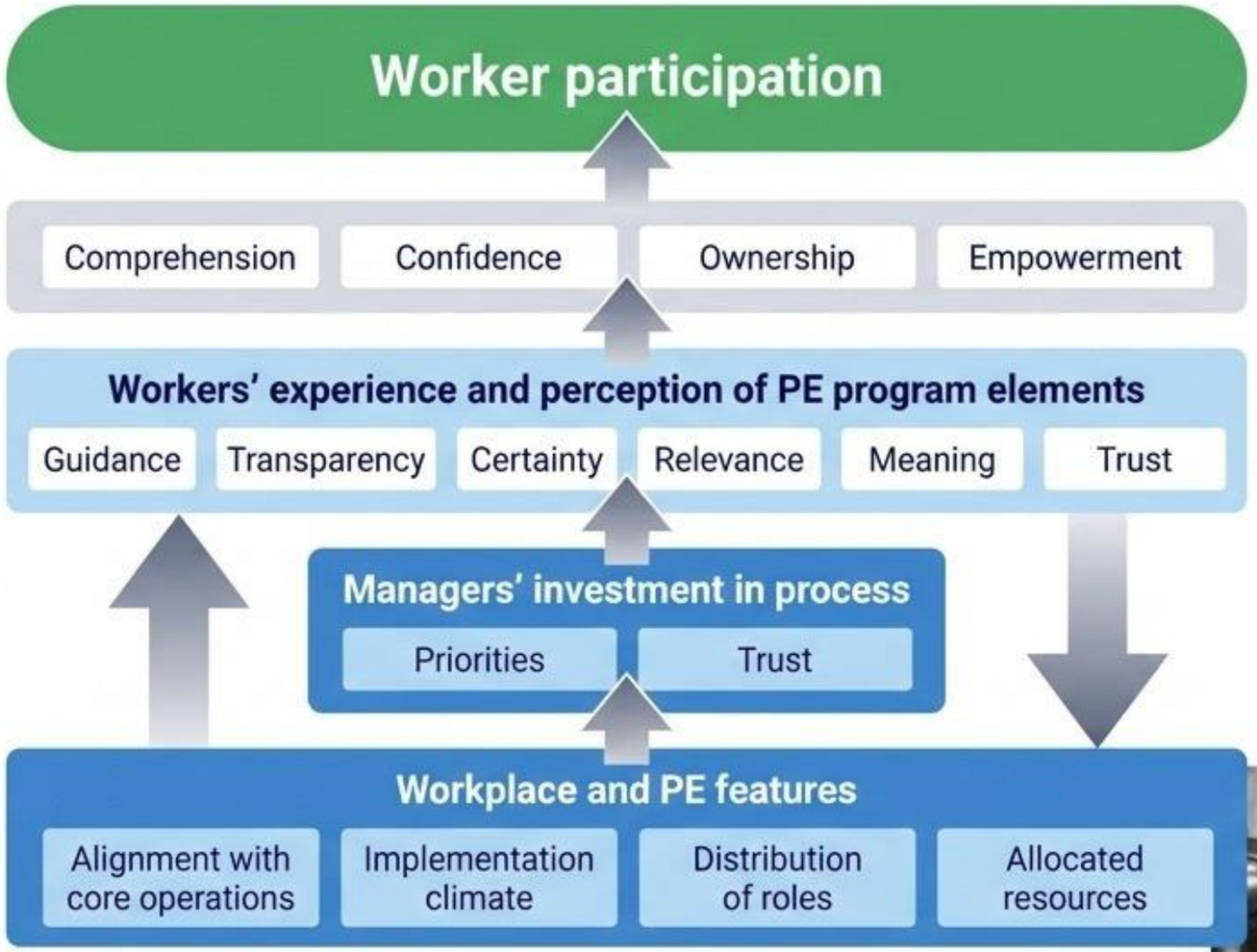
"Design to fit is the most effective control."

Modify the work to fit the worker, not the worker to the work.



Designing WITH the Worker, Not Just FOR the Worker

Expertise:
Taps into tacit knowledge of the job



Trust:
Increases ownership of new systems

Reality:
Bridges the gap between "Work as Imagined" and "Work as Done"

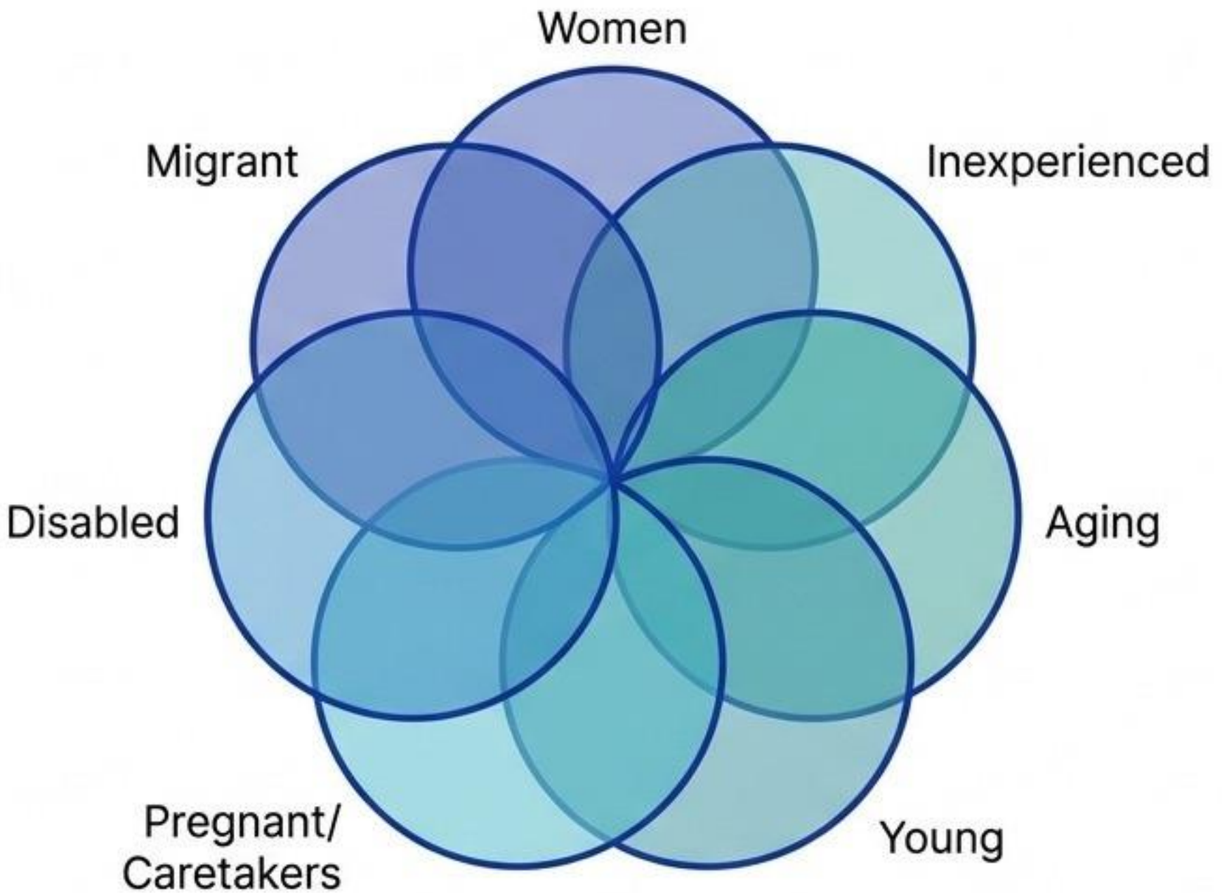
Success requires management investment and a penalty-free reporting culture.

Designing for the Real Population

The “average worker” does not exist.

Women: ~41% of global workforce. Design baseline must include female anthropometrics.

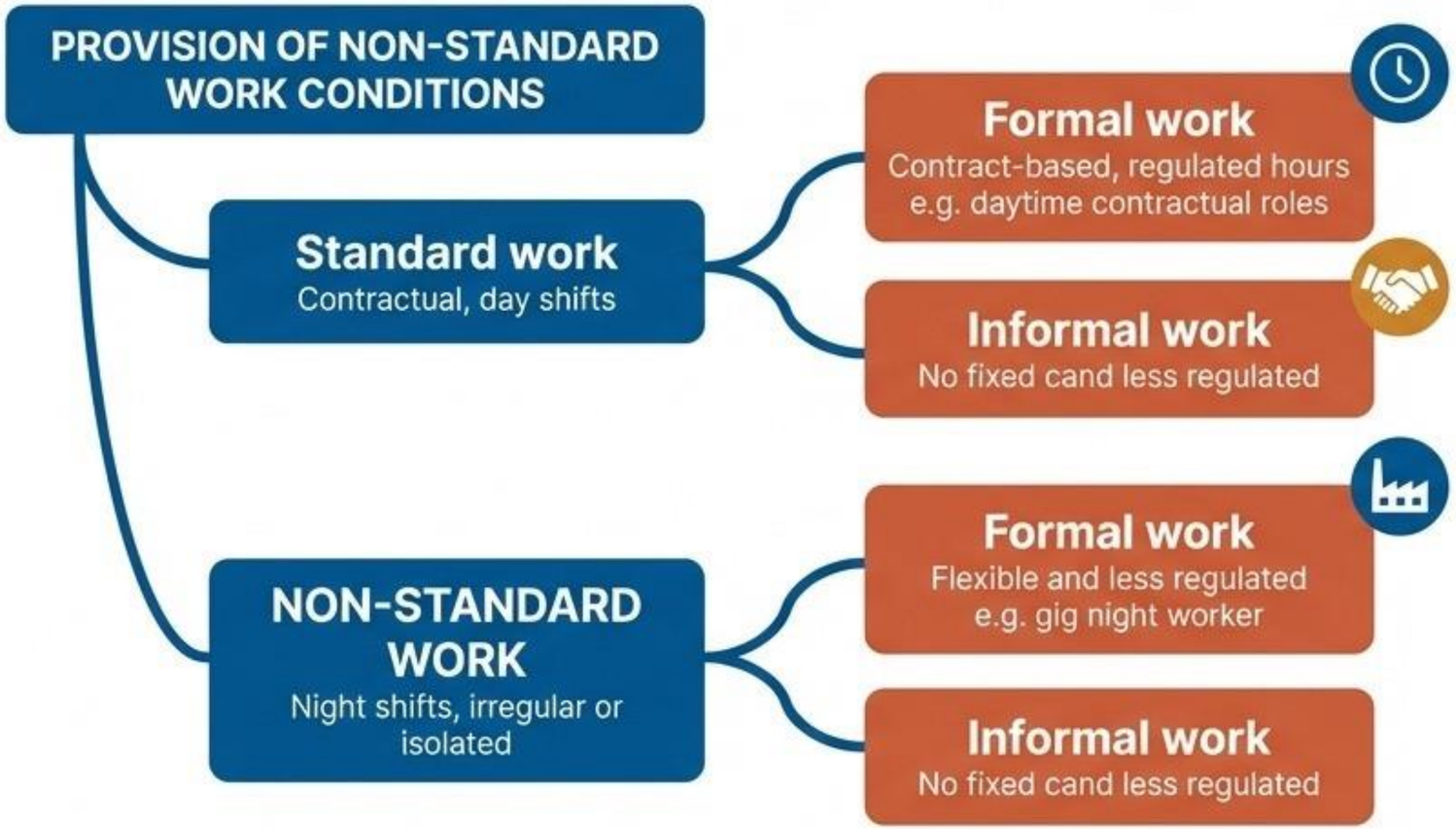
Caregivers:
Need flexible scheduling and adjustable demands.



Aging: Design for visual, auditory, and physical changes.

Migrants:
Safety info must be accessible across language barriers (pictograms).

Protecting the Informal and Non-Standard Workforce



Key Challenges

- **Non-Standard:** Gig/Platform/Remote work. **Risks: Isolation, irregular shifts, lack of oversight.**
- **Informal Economy:** Domestic work, vendors, agriculture. **Risks: Lack of social safety nets.**
- **MSMEs:** Micro/Small enterprises enterprises. **Risks: Lack of HFE resources.**

Action: Adapt HFE strategies (checklists, mobile tools) for invisible sectors.

Sector-Specific Applications

Agriculture:
Machinery safety, pesticide handling.

Mining/Energy:
High-risk trauma, extreme environments.

Manufacturing:
Repetitive motion, vibration.

Services:
Prolonged sitting, cognitive load.

Construction: Fall hazards, dust, vibration.

Education: Voice strain, ergonomic furniture.

Healthcare: Patient handling, shift fatigue.

Transport: Vibration, alertness monitoring.

Responsibilities: The Government (Macro Level)

Key Actions

1. **Legislation:** Embed HFE into OSH laws, not just voluntary guidelines.
2. **Enforcement:** Fund competent inspection bodies trained in HFE.
3. **National Strategy:** Create 'Decent Work' agendas with HFE metrics.
4. **Capacity Building:** Support accreditation for HFE professionals.
5. **Surveillance:** Track lagging indicators (injuries) and leading indicators (exposures).

Responsibilities: The Enterprise (Meso Level)

Government
Legislation, Regulations, and their Enforcement
Guidance and Standards

Labor or Trade Unions, Worker Collectives

Manufacturers and Suppliers

Enterprise
- Company Leadership, Managers, and Supervisors
- Human Resources
- Engineering and Designers
- Occupational Safety & Health (EHS, HFE, etc)
- Facilities, Maintenance, Purchasers
- Workers

HFE Consultants
Professional Societies
Educators

Occupational Medicine Team

Workers' Living Conditions and Other Responsibilities
Job Market, Socio-Economic, and Cultural Environment

Lean Production (Efficiency) +  **Ergonomics (Well-being)** =  **Synergistic Optimization**

HFE is a strategic investment, moving from reactive compliance to proactive strategy.

Future of Work: Navigating the Megatrends

Advanced Tech & AI:
Ensuring human-centricity and control (Industry 5.0).

Labor-Market Supply:
Adapting for aging populations and migration.

HFE ensures technology serves humanity.

Informalization:
Protecting gig and platform workers.

Climate Change:
Resilience against heat stress and disasters.

A Roadmap to Sustainable, Decent Work

- Adopt a **Systems Perspective** to optimize interactions.
- **Prioritize Design** and **Participation** over reactive fixes.
- **Ensure Inclusivity** for all populations and informal sectors.
- **Share Responsibility** between Government, Enterprise, and Workers.

Safer, healthier workers create higher-performing, sustainable enterprises.

References & Acknowledgments

Based on: “Review report on the application of HFE principles to improve workers’ health, safety, wellbeing and performance” (IEA for ILO).